Final

2010 URBAN WATER MANAGEMENT PLAN

Prepared for:

TPWD

Twentynine Palms Water District

Prepared by:
Kennedy/Jenks Consultants

June 2011

RESOLUTION 11-15

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ADOPTING THE 2010 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Urban Water Management Planning Act, Water Code section 10610 et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated Urban Water Management Plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

WHEREAS, the Twentynine Palms Water District (District) is an urban water supplier for purposes of the Act, providing water to over 18,000 customers, and the District approved and adopted its most recent 2005 UWMP and submitted that UWMP to the California Department of Water Resources (DWR); and

WHEREAS, the Water Conservation Act of 2009, Water Code section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt their 2010 UWMPs to July 1, 2011 and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use 15 percent by the year 2015 and 20 percent by the year 2020; and

WHEREAS, the District is an "urban retail water supplier" for purposes of SBX7-7 because it directly provides potable municipal water to more than 3,000 end users; and

WHEREAS, in accordance with applicable law, including the requirements of the Act and SBX7-7, the District has prepared its 2010 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to its 2010 UWMP; and

WHEREAS, as authorized by Section 10620(e) of the Act, the District has prepared its 2010 UWMP with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its 2010 UWMP, and has also in part utilized and relied upon the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan (March 2011) and the DWR Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009) (February 2011) in preparing its 2010 UWMP; and

WHEREAS, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, the District at least twice published notice within its jurisdiction of the Public Hearing to be held on June 22, 2011 regarding the District's 2010 UWMP, provided notice of the time and place of the Public Hearing to applicable counties and cities within which the District provides water supplies, and made its Draft 2010 UWMP available for public inspection prior to holding the Public Hearing; and

WHEREAS, the District held its Public Hearing regarding the 2010 UWMP on June 22, 2011, wherein, among other things, members of the public and other interested entities were provided with the opportunity to be heard in connection with the District's 2010 UWMP and the proposed adoption thereof; and

WHEREAS, pursuant to said June 22, 2011 Public Hearing on the 2010 UWMP, the District encouraged the active involvement of diverse social, cultural, and economic elements of the population within the District's service area with regard to the preparation and adoption of the 2010 UWMP, allowed input by members of the public and other interested entities regarding all aspects of the 2010 UWMP, allowed community input regarding the District's implementation plan for complying with SBX7-7, considered the economic impacts of the District's implementation plan for complying with SBX7-7, and proposed adoption of Method 3 under Water Code section 10608.20(b) for determining the District's urban water use targets; and

WHEREAS, the Board of Directors of the District has reviewed and considered the purposes and requirements of the Urban Water Management Planning Act and SBX7-7, the contents of the 2010 UWMP, the documentation contained in the administrative record in support of the 2010 UWMP, and all public and agency input received with regard to the 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the Twentynine Palms Water District as follows:

1. The District adopts Method 3 under Water Code section 10608.20(b) for determining the District's urban water use targets and approves and adopts the District's 2010 Urban Water Management Plan and orders the Plan filed with the District Secretary.

2. The General Manager is hereby authorized and directed to include a copy of this Resolution in the 2010 Urban Water Management Plan.

3. The General Manager is hereby authorized and directed, in accordance with Water Code Sections 10635(b) and 10644(a), to submit copies of the adopted 2010 Urban Water Management Plan to the California Department of Water Resources, the California State Library, and any city and county within which the District provides water supplies within thirty (30) days of this adoption date.

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the 2010 Urban Water Management Plan available for public review during normal business hours not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources.

5. The General Manager is authorized and directed to implement the components of the 2010 Urban Water Management Plan, including but not limited to, the Demand Management Measures and the Water Shortage Contingency Plan, in accordance with the Urban Water Management Planning Act and SBX7-7.

6. The General Manager is hereby authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2010 Urban Water Management Plan in accordance with applicable law, including the Urban Water Management Planning Act and SBX7-7.

PASSED, APPROVED AND ADOPTED this 22nd day of June 2011 by the following vote:

Ayes: Directors Bourikas, Chambers, Cisneros, Moore and Shinaver
Noes: None

Philip C. Cisneros, President
Board of Directors

Attest:

Mike Wright, Board Secretary
Twentynine Palms Water District

Table of Contents

Table of Contents (cont'd)

Table of Contents (cont'd)

List of Tables

Table of Contents (cont'd)

List of Figures

List of Appendices

Section 1: Introduction

This volume presents the Urban Water Management Plan 2010 (Plan) for the Twentynine Palms Water District (District) service area. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about the District and service area characteristics. A list of acronyms and abbreviations is also provided.

1.1 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments. (The District is going beyond the requirements of the Act by developing a plan which spans 25 years.)

- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.

- Implements conservation and efficient use of urban water supplies.

Additionally, newly passed State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7), was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. As a result, the legislation now mandates each urban retail supplier to develop and report a water use target in the retailer's 2010 UWMP. The legislation further requires that retailers report an interim 2015 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates.

SBX7-7 provides four possible methods for an urban retail water supplier to use to calculate its water use target. The California Department of Water Resources (DWR) has also developed methodologies for calculating base daily per capita water use; baseline commercial, industrial and institutional water use; compliance daily per capita water use; gross water use; service area population; indoor residential water use and landscape area water use.

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix A.

In short, the Plan answers the question: Will there be enough water for the Twentynine Palms Water District community in future years, and what mix of programs should be explored for making this water available?

It is the stated goal of the Twentynine Palms Water District to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

1.2 Implementation of the Plan

The District service area encompasses approximately 86.6 square miles and includes the City of Twentynine Palms. The District is located in the high desert of southern California, approximately 72 miles due east of the City of San Bernardino and 35 miles northeast of the City of Palm Springs, as shown in Figure 1-1. This Plan has been prepared for the Twentynine Palms Water District. This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization.

Kennedy/Jenks Consultants

Engineers & Scientists

Twentynine Palms Water District
2010 Urban Water Management Plan Update

Location Map

K/J 1089073*00
April 2011

Figure 1-1

1.2.1 Groundwater Basin

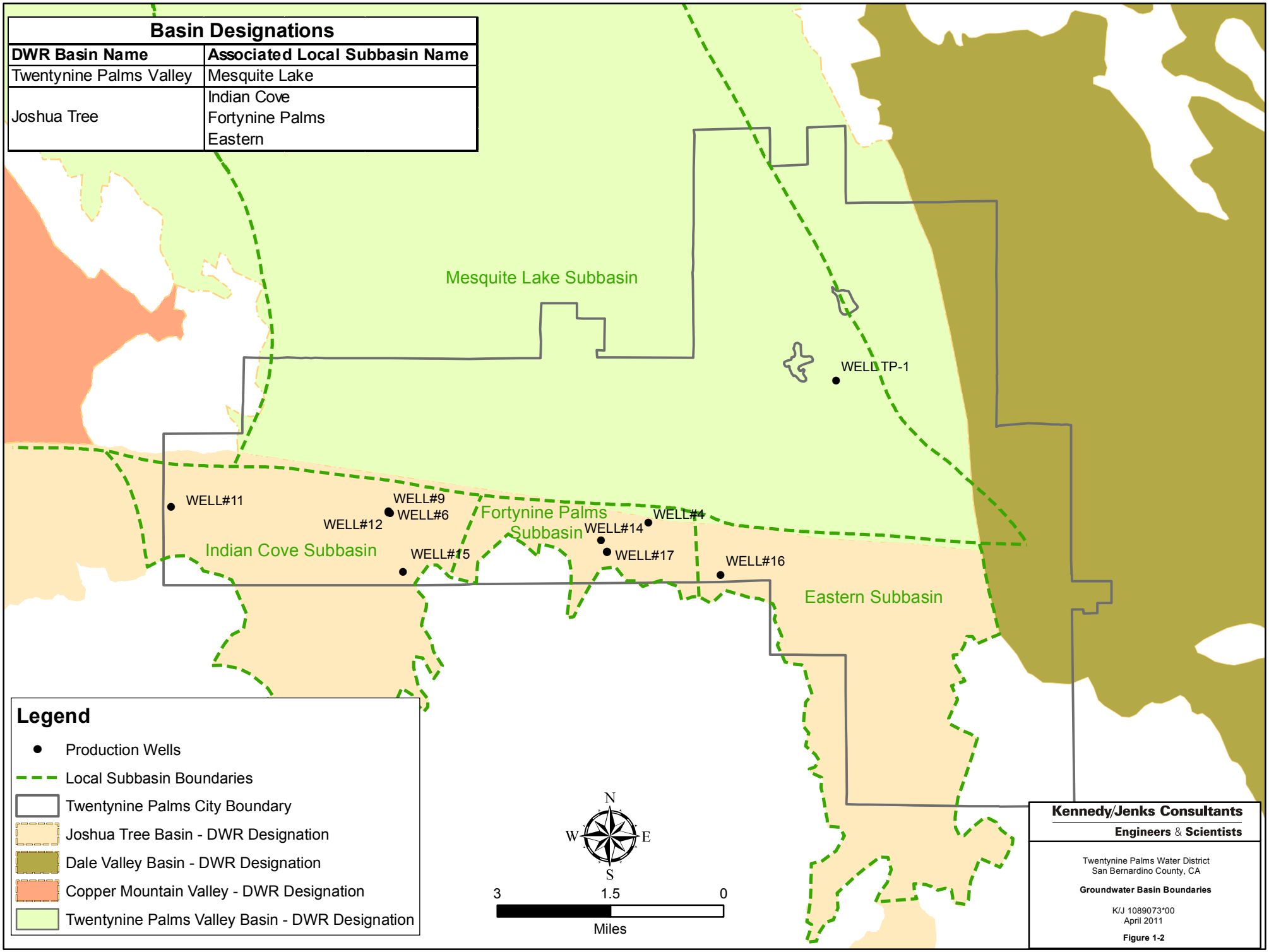
The District is located within the boundaries of three groundwater basins, identified as the Twentynine Palms Valley Groundwater Basin, the Joshua Tree Groundwater Basin and the Dale Valley Groundwater Basin by DWR Bulletin 118-03 (DWR, 2004). The District's portion of the Joshua Tree Groundwater Basin has historically been divided into three subbasins: 1) Indian Cove, 2) Fortynine Palms and 3) Eastern. The Twentynine Palms Valley Groundwater Basin consists of the Mesquite Lake subbasin. The subbasins are shown on Figure 1-2.

Water provided by the District is derived solely from groundwater pumped from supply wells located along the southern limit of the service area. As of 2010, the District has ten (10) active production wells. The remaining wells are inactive and/or used for groundwater monitoring. Available information indicates that more than 400 private wells have also been constructed within the District's service area. Most of these wells are not currently operated.

Connection to imported water from either the Metropolitan Water District of Southern California (MWD) (Colorado River supplies) or the Mojave Water Agency (MWA) (State Water Project supplies) does not appear to be a viable option for the District. The District is not within the service area of either agency and would be required to annex to those service areas to receive supplies. MWD's closest facilities are more than 45 miles southwest of the District; MWA's facilities extend no closer than Yucca Valley, approximately 23 miles west of the District. The District Board has on two occasions voted against extending imported water service to the District.

Historic pumping and water deliveries by the District have steadily increased since its formation in the mid-1950s. Annual pumping in the 1990s regularly exceeded 900 million gallons (approximately 2,760 acre-feet per year [AFY]), with average daily delivery per service connection slightly under 400 gallons. Total water demand in the District was 2,674 acre-feet (AF) in 2010, with a projected demand of 3,119 AF in 2035.

The District neither receives water from a wholesaler nor supplies water to retail water purveyors. As such, information from other agencies was not necessary for the completion of this report. However, copies of the draft UWMP have been sent to the City of Twentynine Palms, County of San Bernardino, Joshua Tree National Park and Joshua Basin Water District for review and comment. Table 1-1 summarizes agency coordination efforts.


Basin Designations
DWR Basin Name | Associated Local Subbasin Name
Twentynine Palms Valley | Mesquite Lake
Joshua Tree | Indian Cove
Fortynine Palms
Eastern
Mesquite Lake Subbasin
WELL TP-1
WELL#11
WELL#9
WELL#6
WELL#12
Fortynine Palms Subbasin
WELL#14
WELL#4
Indian Cove Subbasin
WELL#15
WELL#17
WELL#16
Eastern Subbasin
Legend
Production Wells
Local Subbasin Boundaries
Twentynine Palms City Boundary
Joshua Tree Basin - DWR Designation
Dale Valley Basin - DWR Designation
Copper Mountain Valley - DWR Designation
Twentynine Palms Valley Basin - DWR Designation
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Engineers & Scientists
Twentynine Palms Water District
San Bernardino County, CA
Groundwater Basin Boundaries
K/J 1089073*00
April 2011
Figure 1-2

TABLE 1-1
AGENCY COORDINATION SUMMARY

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
City of Twentynine Palms		X				X	
County of San Bernardino		X				X	
Joshua Tree National Park		X				X	
Joshua Basin Water District		X				X	

1.2.2 Public Outreach

Twentynine Palms notified the cities and counties within its service area of the opportunity to provide input regarding the Plan. Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, website postings, and invitation letters are attached in Appendix B.

TABLE 1-2
PUBLIC PARTICIPATION TIMELINE

June 9, 2011	Preliminary Draft UWMP	Preliminary Draft released to solicit input
June 22, 2011	Public Hearing	UWMP considered for approval and adopted by the Board

The components of public participation include:

Local Media

- Paid advertisements in local newspapers

Water Agencies Outreach

- Joshua Basin Water District

City/County Outreach

- City Planning Division
- County of San Bernardino Land Use Services Department Planning Division

Public Availability of Documents

- District website
- City Hall
- Local libraries

1.2.3 Resources Maximization

The District's sole source of water is groundwater. The 2008 Groundwater Management Plan (GWMP) was created to outline the role of the District in the management of the local groundwater resources and to develop a management plan that can be implemented by the District to protect the quality and quantity of groundwater within its service area. The GWMP also assesses the current status of the groundwater basin and defines how to best manage the basin under local control. The GWMP proposes six Basin Management Objectives (BMO) to the District; a number of them promoting conservation. Additional discussion regarding documents developed to maximize resources is included in Section 3.4 and Chapter 6.

1.3 Climate

The climate in the District's water service area is arid, with average annual rainfall of less than five inches, most of which occurs during the winter months. Temperatures range from 20 to 60°F during the winter and from 80 to 110°F degrees during the summer. Table 1-3 presents the region's annual average climate data. .

TABLE 1-3
CLIMATE DATA

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo[(a)]	1.59	2.20	3.66	5.08	6.83	7.80
Average Rainfall (inches)	0.4	0.3	0.4	0.1	0.1	0.0
Average Max. Temperature (Fahrenheit)	63	68	74	82	91	101
Average Min. Temperature (Fahrenheit)	36	39	43	49	57	65

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo	8.67	7.81	5.67	4.03	2.13	1.59	57.06
Average Rainfall (inches)	0.7	0.8	0.5	0.3	0.3	0.4	4.3
Average Max. Temperature (Fahrenheit)	105	103	98	86	72	63	84
Average Min. Temperature (Fahrenheit)	72	70	64	53	42	35	52

Note:
(a) Standard Monthly Average ETo determined from CIMIS Station No. 118 Cathedral City.

1.4 Potential Effects of Global Warming

In the 2009 update of the DWR *California Water Plan*, multiple scenarios of future climate conditions are evaluated. These changing hydrological conditions could affect future planning efforts, which are typically based on historic conditions. The *California Water Plan* identifies the following probable impacts due to changes in temperature and precipitation:

- Decrease in snowpack, which is a major part of annual water storage, due to increasing winter temperatures.
- More winter runoff and less spring/summer runoff due to warmer temperatures.
- Greater extremes in flooding and droughts.
- Greater water demand for irrigation and landscape water due to increased temperatures and their impacts on plant water needs.

1.5 Other Demographic Factors

Residential development is currently the single largest land use within the District. Approximately 80 percent of the residential development is single-family homes. The remaining 20 percent of the District's land use is made up of some multi-family residential units, commercial properties, and minor light industry. The current population served by the District is approximately 18,800 (based on 2009 data). There is no community sewage system and wastewater is disposed through individual septic tank and tile field disposal systems.

Prior to 1954, the Twentynine Palms area was served by three privately owned water companies: (1) Abell Water Company, (2) Condor Mutual Water Company, and (3) Pacific Water Company. The District was formed and immediately purchased the three water companies. Their wells, storage facilities, and piping served as the initial water system for the District.

Potable water is scarce in the District for several reasons:

1) The area receives an average of only four inches of annual rainfall.

2) There is negligible infiltration of direct precipitation in areas where the alluvial deposits are thick.

3) A substantial amount of runoff is lost to evaporation after flowing into the basin.

4) Some of the water is unsuitable for drinking water due to naturally-occurring soluble minerals, such as fluoride.

1.6 List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
Act	California Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
bgs	Below ground surface
BMO	Basin Management Objective
BMPs	Best Management Practices
CCR	Consumer Confidence Report
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Institutional
City	City of Twentynine Palms
CUWCC	California Urban Water Conservation Council
DBP	Disinfection by-products
District	Twentynine Palms Water District

DMM	Demand Management Measures
DOF	Department of Finance
DWR	California Department of Water Resources
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GWMP	Groundwater Management Plan
HECW	High-Efficiency Clothes Washer
ILI	Infrastructure Leak Index
kW	kilowatt
MCL	Maximum Contaminant Level
mgd	million gallons per day
mg/L	milligrams per liter
MFR	Multi-Family Residential
MOU	Memorandum of Understanding
MWA	Mojave Water Agency
MWD	Metropolitan Water District of Southern California
Plan	Urban Water Management Plan 2010
SBX7-7	Senate Bill 7 of Special Extended Session 7
SFR	Single-Family Residential
SWP	State Water Project
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WSS	WaterSense Specifications

Section 2: Water Use

This chapter describes historic and current water usage and the methodology used to project future demands within Twentynine Palms Water District's service area. Water usage is divided into sectors such as residential, industrial, landscape, and other purposes. To undertake this evaluation, existing land use data and new housing construction information were compiled from the District. This information was then compared to historical trends for new water service connections and customer water usage information.

2.1 Population

The District currently serves 7,983 connections, all of which are metered accounts. Approximately 94 percent of the service connections are residential. Commercial connections account for approximately 4.5 percent, landscape irrigation connections account for less than 1 percent, and fire protection/non-potable connections account for the remaining 1.4 percent of the District's total connections. Table 2-1 provides a summary of the District's historic service connections.

TABLE 2-1
HISTORIC SERVICE CONNECTIONS

Land Use	1994	2000	2005	2009	2010
Single Family Residential	5,956	5,237	5,895	6,314	6,368
Multi-Family Residential	824	1,047	1,045	1,110	1,111
Commercial/Institutional	333	379	456	362	363
Industrial	0	0	0	0	0
Landscape Irrigation	0	15	18	26	29
Other (Fire Protection/ Non-potable)	NA[(a)]	104	4	108	112
Total	**7,113**	**6,782**	**7418**	**7,920**	**7,983**

Source: District water records.
Note: (a) Data not available.

When determining historic population estimates, the District's residential service connection data was divided into four categories including: Single Family Residential (SFR) units within the city limits of Twentynine Palms; SFR units in unincorporated areas of the service area; SFR units with unspecified location; and Multi-family Residential (MFR) units. Each category was multiplied by a "persons per household" factor depending on the type of units. The SFR units within the city and the MFR units were multiplied by a factor provided by the Department of Finance (DOF). The other two categories were multiplied by factors from the Fire Facilities Impact Study performed for the City of Twentynine Palms. Table 2-2 shows the resulting historic population estimates.

TABLE 2-2
HISTORIC POPULATION ESTIMATES

2006	2007	2008	2009	2010
18,462	18,716	18,736	18,737	18,795

The historic populations determined in Table 2-2 and data from the DOF were used to determine population projections presented in Table 2-3.

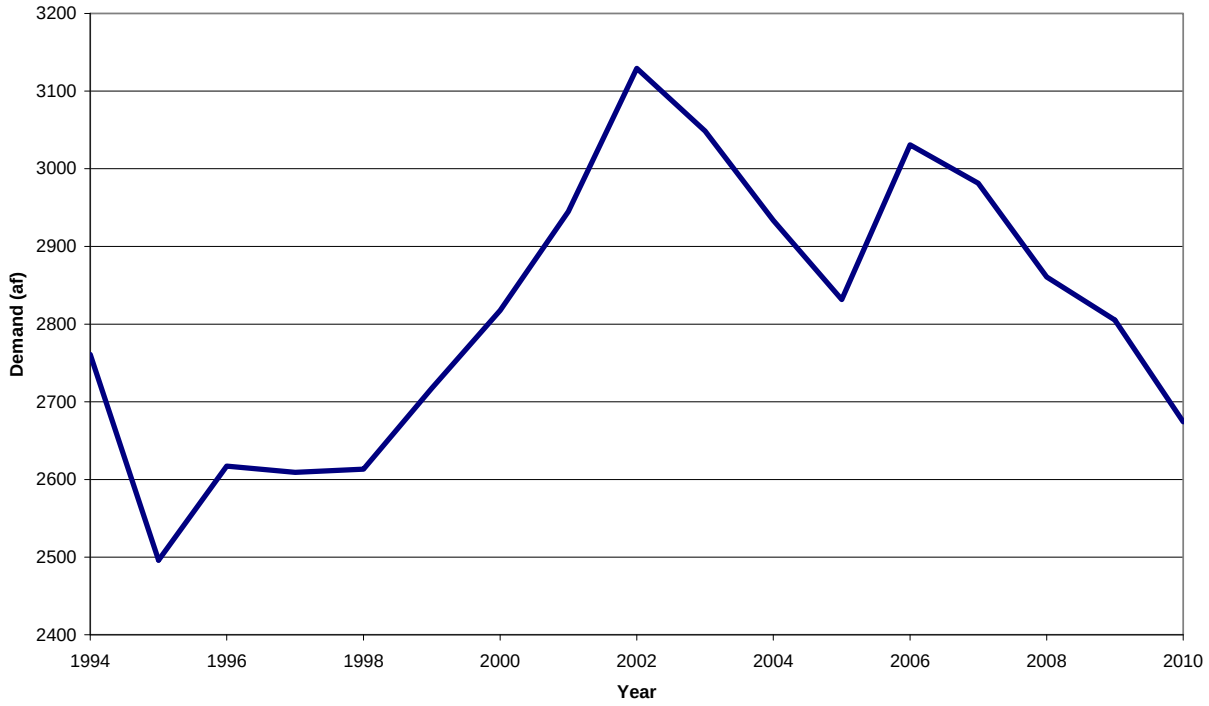
TABLE 2-3
PROJECTED POPULATION ESTIMATES

2015	2020	2025	2030	2035
22,135	25,476	27,339	29,202	30,931

2.2 Historic Water Use

Predicting future water supply requires accurate historic water use patterns and water usage records. Both the economy and entitlement process (compliance with the California Environmental Quality Act [CEQA]) are key factors impacting growth in population and demand. Figure 2-1 presents the historical deliveries by the District since 1994.

Figure 2-1
Historical Annual Total Demand



District water demand during 2010 was 2,674 AF, as shown in Figure 2-1 and Table 2-4. The principal types of water connections include: (1) residential, (2) commercial/institutional, (3) landscape irrigation and (4) fire protection/non-potable. Each of these water demand sectors are briefly summarized in Table 2-4.

TABLE 2-4
ESTIMATED ANNUAL WATER USE

Land Use	Annual Water Use (AFY)[a]								
	1994	2000	2005	2010	2015[b]	2020[b]	2025[b]	2030[b]	2035[b]
Single Family Residential	2,183	1,686	1,717	1,727	2,525	2,801	3,006	3,211	3,401
Multi-Family Residential	261	552	564	442	623	691	741	792	839
Commercial/Institutional	316	339	291	278	417	462	496	530	561
Industrial	0	0	0	0	0	0	0	0	0
Landscape Irrigation	0	111	108	125	112	125	134	143	151
Other (Fire Protection/ Non-potable)	0	131	153	102	124	138	148	158	167
Total	**2,761**	**2,818**	**2,832**	**2,674**	**3,801**	**4,216**	**4,525**	**4,833**	**5,119**

Source: District water records.
Notes:
(a) All estimated demand values rounded up to nearest AF. Actual demands may vary by approximately plus or minus 10 percent due to hydrological conditions.
(b) Future demand projections are estimated by using the average percent of the total for years 1994-2010.

2.2.1 Residential

It is estimated the annual residential sector water demand is approximately 81 percent (2,169 AFY) of total District demand in 2010. As shown in Table 2-4, District records indicate that current average water demand per account is approximately 0.27 AFY (980 cubic feet per month).

The average water demand per multi-family account was approximately 0.40 AFY (1,452 cubic feet per month) in 2010. The District's average household water use is 0.29 AFY or 259 gallons per day.

2.2.2 Non-Residential

According to District records, as shown in Table 2-4, annual commercial water demand accounts for approximately 10 percent (278 AFY) of total District demand in 2010 with an average water use per account of 0.77 AFY (2,795 cubic feet per month). Landscape irrigation accounted for approximately 5 percent (125 AFY) of total District demand. There is no agricultural irrigation within the District.

2.2.3 Fire Protection/Non-Potable

The District also provides water supply for commercial fire protection through detector check meters. (Public fire protection is provided by the distribution system through fire hydrants along public streets.) Non-potable service is available for construction purposes through temporary meters. Commercial fire protection and construction demands accounted for approximately 4 percent (102 AFY) of the District's total demand in 2010.

2.2.4 Sales to Other Agencies

The District does not sell water to any other agencies.

2.2.5 Unaccounted-For Water

In addition to the traditional demand sources, there is another component that impacts the District's water demands known as "Unaccounted-For Water." This component is typically defined as the difference between water production and water sales. These water losses can come from authorized, but unmetered sources, such as fire fighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters.

Table 2-5 indicates unaccounted-for water loss within the distribution system was 10.9 percent of total District demand (326 AFY) in 2010, a decrease of 3.3 percent from 2005. The reduced value observed in 2001 was a direct effect of the District's main replacement program and inclusion of metered water use for fire protection, which is now complete. Table 2-5 provides a summary of the District's unaccounted-for water loss since 1990.

TABLE 2-5
UNACCOUNTED-FOR WATER LOSSES WITHIN THE DISTRICT

Year	Water Production (AFY)	Water Sales (AFY)	Unaccounted-for Water (AFY)	Unaccounted-for Water (Percent)
1990	2,794	2,498[(a)]	296	10.6
1995	3,013	2,496[(a)]	518	17.2
2000	3,248	2,818	431	13.3
2001	3,250	2,945	306	9.4
2005	3,300	2,832	468	14.2
2009	3,035	2,805	230	7.6
2010	3,000	2,674	326	10.9

Note: (a) Does not include water used for fire protection.

2.3 Existing and Targeted Per Capita Water Use

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the *20 by 2020 Water Conservation Plan*. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day (gpcd); reporting is to begin with the 2010 UWMP.

The two primary calculations required by SBX7-7 are:

1. Base Daily Water Use calculation (average gpcd used in past years)
2. Compliance Water Use Target (target gallons per capita per day in 2015 and 2020)

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010 or a 15-year average if ten percent of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use
2. Per capita daily water use estimated using the sum of the following:
    a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20 percent reduction target, this standard may be adjusted by the Legislature by statute.
    b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
    c. For commercial, industrial, and institutional (CII) uses, a ten percent reduction in water use from the baseline CII water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft *20 by 2020 Water Conservation Plan*. The District is located within the Colorado River Hydrologic Region; the region target is 211 gpcd.
4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
    a. Indoor residential water use to be reduced by 15 gpcd or an amount determined by use of DWR's "BMP Calculator".
    b. A 20 percent savings on all unmetered uses.
    c. A 10 percent savings on baseline CII use.
    d. A 21.6 percent savings on current landscape and water loss uses.

The Interim Water Use Target is set as a halfway point between the Base Daily Water Use gpcd and the 2020 Compliance Water Use Target gpcd.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable gpcd". The Maximum Allowable gpcd is based on 95 percent of a 5-year average base gross water use ending no earlier than 2003 and no later than 2010. The Maximum Allowable gpcd is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction of the SBX7-7 legislation. If an agency's Compliance Water Use Target is higher than the Maximum Allowable gpcd, the agency must instead use the Maximum Allowable gpcd as their target.

2.3.1 Base Daily Per Capita Water Use for SBX7-7 Reduction

Consistent with SBX7-7, the 2010 UWMPs must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in the previous section. Base gross water use is defined as the total volume of water, treated or untreated, entering the distribution system of the District, excluding: recycled water; net volume of water placed into long-term storage; and water conveyed to another urban water supplier.

The UWMP Act allows urban water retailers to evaluate their base daily per capita water use using a 10 or 15-year period. A 15-year base period within the range January 1, 1990 to December 31, 2010 is allowed if recycled water made up 10 percent or more of the 2008 retail water delivery. If recycled water did not make up 10 percent or more of the 2008 retail water delivery, then a retailer must use a 10-year base period within the range January 1, 1995 to December 31, 2010. Recycled water did not make up 10 percent of the 2008 delivery to the District's retail areas and for this reason Base Daily Per Capita Water Use has been based on a 10-year period. In addition, urban retailers must report daily per capita water use for a five-year period within the range January 1, 2003 to December 31, 2010. This 5-year base period is compared to the Target Based Daily Per Capita Water Use to determine the minimum water use reduction requirement (this is described in more detail in the following sections). Table 2-6 reports the data used to calculate the Base Daily Per Capita Water Use in gallons per capita per day (gpcd), and the 10-year and 5-year base periods.

TABLE 2-6
BASE DAILY PER CAPITA WATER USE

Base Period Year		Distribution System Population	Annual System Gross Water Use (AFY)	Annual Daily Per Capita Water Use (gpcd)	10-Year Average (gpcd)	5-Year Average (gpcd)
Sequence Year	*Calendar Year*					
1	1995	17,820	2,496	125		
2	1996	16,587	2,617	141		
3	*1997*	*16,133*	*2,609*	*144*		
4	*1998*	*16,317*	*2,613*	*143*		
5	*1999*	*16,308*	*2,717*	*149*		
6	*2000*	*16,006*	*2,818*	*157*		
7	*2001*	*17,832*	*2,945*	*147*		
8	*2002*	*17,824*	*3,129*	*157*		
9	*2003*	*17,514*	*3,048*	*155*		
10	*2004*	*18,727*	*2,934*	*140*	145.86	
11	*2005*	*19,982*	*2,832*	*127*	146.00	
12	*2006*	*18,462*	*3,031*	*147*	146.57	
13	2007	18,716	2,982	142	146.36	142.10
14	2008	18,736	2,861	136	145.69	138.29
15	2009	18,737	2,805	134	144.18	137.05
16	2010	18,795	2,674	127	141.17	137.15
			Base Daily Per Capita Water Use		**147**	**142**

Note: *Italicized* cells show calendar years used in selected 10-year average.

2.3.2 Compliance Water Use Targets

In addition to calculating base gross water use, SBX7-7 requires that a retail water supplier identify its water demand reduction targets. The methodologies for calculating demand reduction were described in Section 2.2. The District has selected Method 3 to calculate its 2020 Compliance Water Use Target and Interim Water Use Target. The Maximum Allowable Daily Use is 135 gpcd (95 percent of the 5-Year Average).

Twentynine Palms Water District is located in the Colorado River Hydrologic Region which has an Urban Water Use Target of 211 gpcd. Ninety-five percent of this target is 200 gpcd. Since Twentynine Palms' 5-year Average Base Daily Per Capita Water Use is lower than 200 gpcd, 135 gpcd is used for the District's 2020 Compliance Water Use Target.

For the 2015 Interim Urban Water Use Target – the water use goal each water supplier is to achieve and report in their 2015 UWMP – the average of the Base Daily Per Capita Water Use and the Urban Water Use Target is used. For Twentynine Palms Water District, the average of these numbers is 141 gpcd. Table 2-7 summarizes these targets.

TABLE 2-7
WATER USE TARGET CALCULATION – METHOD 3

Selected 10-year Average Base Daily Water Use	147 gpcd
Selected 5-Year Average Base Daily Water Use	142 gpcd
Compliance Water Use Target (95% of Hydrologic Region Target)	200 gpcd
Maximum Allowable Water Use Target (95% of 5-Year Average)	135 gpcd
2015 Target (Average of 10-year and Maximum Allowable)	141 gpcd
2020 Target (same as Maximum Allowable Water Use Target)	135 gpcd

2.4 Projected Water Use

Estimating future water demand is a function of several factors. Water usage is influenced by geographic location, topography, land use, demographics, and water system characteristics (i.e., system pressures, water quality, and metering of connections). Therefore, water demand characteristics within the District will differ from water demands of other areas in Southern California according to each of these factors.

Historic population estimates were compared to the customer demands from 1994 to 2010 to determine historic per capita use. SBX7-7 calculations were used to provide a baseline and target per capita water use. The population was projected out to year 2035 using the decreasing growth rates determined by the DOF for San Bernardino County. The growth rate decreases from 3.55 percent per year in 2011 to 1.13 percent per year in 2035. Future demand estimates were then determined by multiplying the projected population by the base per capita water use:

$$AFY = \frac{\text{Population} \times \text{GPCD (target)} \times 365 \text{ days per year}}{325{,}851 \text{ gallons per AF}}$$

These calculations provided the District's projected future water demands in Table 2-8. The anticipated total water demand in 2035 will be approximately 5,093 AFY. Demand estimates do not include reductions from demand management practices.

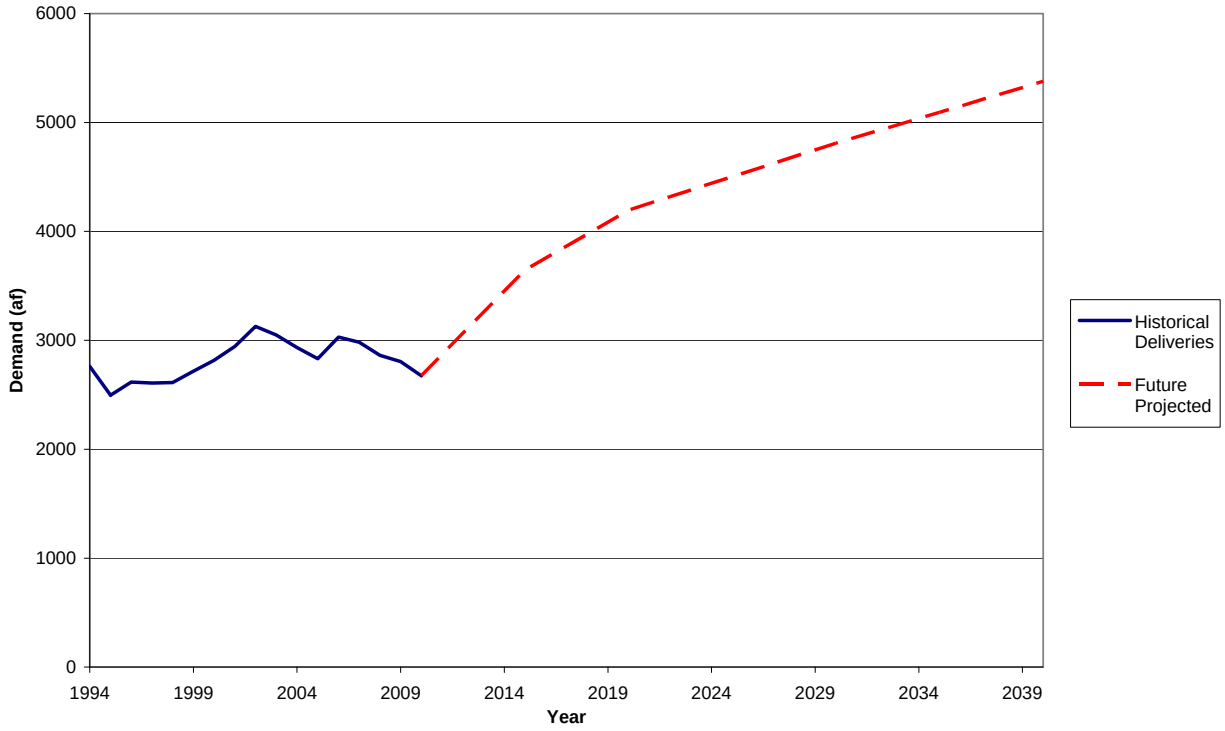
TABLE 2-8
PROJECTED DISTRICT WATER DEMANDS

	2015	2020	2025	2030	2035
Demand (AFY)[(a)]	3,645	4,195	4,502	4,808	5,093

Note: (a) Actual demands may vary by approximately plus or minus 10 percent due to hydrological conditions.

Figure 2-2 presents the District's historical deliveries and projected water demands.

Figure 2-2
Historical Deliveries and Future Projected Water Demands



Several factors can affect demand projections, including:

- Land use revisions
- New regulations
- Consumer choice
- Economic conditions
- Transportation needs

- Highway construction
- Environmental factors
- Conservation programs
- Plumbing codes

The foregoing factors affect the amount of water needed, as well as the timing of when it is needed. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future plumbing codes or other regulatory changes.

2.4.1 Water Use Projections for Low Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The District includes the jurisdictions of the City of Twentynine Palms and outlying areas.

The City of Twentynine Palms adopted their General Plan in 2010, which includes an estimate of "extremely low", "very low" and "low" income households. These are shown in Table 2-9.

TABLE 2-9
PERCENTAGE OF VERY LOW AND LOW INCOME HOUSEHOLDS

Household Type	Percentage
Extremely Low	13.2
Very Low	16.3
Low	24.7
Total	**54.2**

The total of 54.2 percent was used for projections of water demand from extremely low, very low and low-income households as shown in Table 2-10.

TABLE 2-10
PROJECTIONS OF FUTURE LOW-INCOME HOUSEHOLD WATER USE (AF)

Water Use[(a)]	2015	2020	2025	2030	2035
Estimated Very Low and Low-Income Household Water Use	1,611	1,854	1,990	2,125	2,251

Note:
(a) Assumes 40.0 percent of all future households in Park service area qualify as "very-low" or "low" income per the definition provided in Senate Bill 1087.

Further, the District will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- The District specifically finds that it does not have sufficient water supply;
- The District is subject to a compliance order issued by the California Department of Public Health (CDPH) that prohibits new water connections; or
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

2.5 Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. The California Plumbing Code has instituted requirements for new construction that mandate the installation of ultra low-flow toilets and low-flow showerheads. The District has developed water conservation measures that include public information and education programs.

Residential, commercial, and industrial usage can be expected to decrease as a result of the implementation of more aggressive water conservation practices. As previously discussed, the greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation. Irrigation demand can represent as much as 50 percent of the water demand for residential customers depending upon lot size and amount of irrigated turf and plants.

Section 3: Water Resources

This section describes the water resources available to Twentynine Palms Water District for the 25-year period covered by the Plan. These are summarized in Table 3-1 and discussed in more detail below. Both currently available and planned supplies are discussed.

The term "dry" is used throughout this chapter and in subsequent chapters concerning water resources and reliability as a measure of supply availability. As used in this Plan, dry years are those years when supplies are the lowest, which occurs primarily when precipitation is lower than the long-term average precipitation. The impact of low precipitation in a given year on a particular supply may differ based on how low the precipitation is, or whether the year follows a high-precipitation year or another low-precipitation year. Also, dry conditions can differ geographically. When the term "dry" is used in this Plan, statewide drought conditions are assumed.

The District encompasses four non-adjudicated groundwater subbasins: Indian Cove, Mesquite Lake, Eastern, and Fortynine Palms. Figure 1-1 provides a map of the groundwater basin boundaries and well locations. The District's existing Groundwater Management Plan (2008) is included as Appendix B. Groundwater is the only existing source of water for the District.

Geology and groundwater characteristics of the subbasins are similar, as they are contiguous. However, there are some differentiating characteristics among the subbasins, as discussed in the following subsections. More data are available on Indian Cove Subbasin than the others, as many of the District's existing production wells are located within this Subbasin. Table 3-1 provides a summary of the District's historic water supply. Total water production in the District has remained relatively stable showing only a slight increase over the last 20 years, from a low of 2,728 AFY in 1991 to a high of 3,416 AFY in 2002.

TABLE 3-1
HISTORIC WATER PRODUCTION

Year	AF
1990	2,788
1991	2,728
1992	2,961
1993	3,013
1994	3,132
1995	3,013
1996	3,144
1997	2,983
1998	3,030
1999	3,077
2000	3,248
2001	3,105
2002	3,416
2003	3,200
2004	3,203
2005	3,152

Year	AF
2006	3,340
2007	3,328
2008	3,416
2009	3,123
2010	2,977

3.1 Wholesale (Imported) Water Supplies

The District does not import water and relies solely on groundwater to meet its demand.

3.2 Groundwater

This section presents information about Twentynine Palms Water District groundwater supplies, including a summary of the adopted GWMP. The District currently relies solely on groundwater as its source. The District overlies two non-adjudicated groundwater basins, the Joshua Tree Basin and Twentynine Palms Valley Basins (Mesquite Springs Basin). Within the Joshua Tree Basin are three subbasins, the Indian Cove, Fortynine Palms, and Eastern Subbasins. Table 3-2 shows the total water supplies pumped from all basins.

TABLE 3-2
CURRENT AND PLANNED WATER SUPPLIES (AF)

Water Supply Sources	2010	2015	2020	2025	2030	2035
Water purchased from:						
Wholesale (imported) supplier	0	0	0	0	0	0
Supplier produced groundwater[(a)]	2,977	6,985	6,985	6,985	6,985	6,985
Supplier surface diversions	0	0	0	0	0	0
Transfers in or out	0	0	0	0	0	0
Exchanges In or out	0	0	0	0	0	0
Recycled Water (projected use)	0	0	0	0	0	0
Desalination	0	0	0	0	0	0
Total	**2,977**	**6,985**	**6,985**	**6,985**	**6,985**	**6,985**

Note: (a) 2010 is actual pumping, future years are total pumping capacity taking into consideration guidelines in DWR Bulletin 118-03.

3.2.1 Twentynine Palms Valley Basin

The Twentynine Palms Valley Groundwater Basin encompasses 97.5 square miles and underlies most of the northern portion of the District's service area (see Figure 1-2). It is bound to the south by the Pinto Mountain fault, the north by the "transverse arch", the west by the Surprise Spring Fault, and the east by the Mesquite Fault. Water is produced from this basin through the TP1 production well, which provides water for the Fluoride Removal Water Treatment Plant. The basin underlies an alluvial valley in the southern Mojave Desert below the dry Mesquite Lake and the town of Twentynine Palms. Water-bearing materials in the basin consist of unconfined, unconsolidated to partly consolidated Miocene to Quaternary continental deposits.

The most productive water-bearing deposits are interbedded gravels, conglomerates, and silts deposited in alluvial fan systems. Other, less productive deposits include alluvial channel sands and gravels, active silt, clay, sandy-clay deposits and dune sands. Water-bearing deposits in the basin are up to 10,000 feet in thickness Groundwater flows generally from west to east toward Mesquite Lake. The Pinto Mountain fault zone acts as a barrier to groundwater flow, and the water level is 100 feet lower in the Twentynine Palms Valley Basin than in the Joshua Tree Basin. The Mesquite fault is also a barrier to groundwater flow, with water levels being 240 feet higher on the eastern border of the Twentynine Palms Valley Basin than in the adjacent Dale Valley Basin. The "transverse arch" on the northern border acts as a partial barrier to groundwater flow to the south, but allows some flow from the Deadman Valley Basin into the Twentynine Palms Valley Basin.

Groundwater levels in the basin are generally stable. Very little data on the depth to bedrock are available for the Twentynine Palms Valley Basin. Water level depths vary widely, ranging from depths of less than 50 feet to more than 400 feet below ground surface (bgs). Water elevations also vary from between 1,700 to 1,850 feet. No water level declines have been observed in the basin. Mesquite Lake Subbasin (Twentynine Palms Valley Basin).

The Mesquite Lake Subbasin is bounded by the Surprise Spring Fault on the west and the Mesquite Fault on the east. Separated by the Pinto Mountain Fault to the south are the Indian Cove, Fortynine Palms, and Eastern Subbasins. The one high-capacity production well with a pumping capacity of 2,100 gallons per minute (gpm) (3,395 AFY) is pumped from the Mesquite Lake Subbasin. Groundwater from this well is extracted from the Mesquite Lake Subbasin, treated to remove fluoride to below the maximum Contaminant Level (MCL), and delivered to District customers.

Very little data on the depth to bedrock are available for the Mesquite Lake Subbasin. Water level depths vary widely, ranging from depths of less than 50 feet to more than 400 feet below ground surface (bgs).

Water elevations also vary from between 1,700 to 1,850 feet above mean sea level. No water level declines have been observed in the Mesquite Lake Subbasin. Water quality in the Mesquite Lake Subbasin is not as good as in the other subbasins used for potable water.

3.3 Joshua Tree Basin

The Joshua Tree Groundwater Basin encompasses 53.8 square miles and underlies an area south of the Pinto Mountain fault beneath the town of Joshua Tree, eastward to immediately south of the town of Twentynine Palms. The Basin's northern area borders to the Twentynine Palms Valley Basin along the Pinto Mountain fault. The southern boundary is exposed consolidated basement of the Little San Bernardino Mountains within Joshua Tree National Park. The western boundary of the basin is coincident with a basement constriction located between the towns of Yucca Valley and Joshua Tree. The eastern boundary of the basin lies along a line extending from the southern tip of the Mesquite fault to a basement outcrop of the Little San Bernardino Mountains.

Like the Twentynine Palms Valley Basin, productive water-bearing materials in the basin also consist of unconsolidated to partly consolidated Miocene to Quaternary continental deposits to a depth of 10,000 feet in thickness. However, because the basin incorporates additional areas of

shallower alluvial fill, average thickness is about 500 feet. Also similar to the Twentynine Palms Valley Basin, groundwater in the basin typically occurs in interbedded gravels, conglomerates, and silts deposited in alluvial fan systems.

Groundwater generally flows eastward in the region, and travels northward in the Joshua Tree Basin towards the Pinto Mountain fault, then eastward and possibly discharges through the Pinto Mountain fault into the Copper Mountain Basin. However, the Pinto Mountain fault is a groundwater barrier, with water levels about 125 feet lower in the Copper Mountain Valley Basin north of the fault than in the Joshua Tree Basin to the south. The constriction that forms the western boundary of the basin appears responsible for an eastward drop in groundwater level of about 400 feet. Data support that water levels in the basin have been dropping by an average of a foot per year since 1973.

3.3.1 Indian Cove Subbasin

The Indian Cove Subbasin encompasses 20 square miles and is located southwest of the City of Twentynine Palms in the Joshua Tree Basin. It is bounded on the north by the Pinto Mountain Fault, which separates it from the Mesquite Lake Basin. It is directly west of the Fortynine Palms Subbasin. Five of the District's production wells are in this subbasin. The Indian Cove Subbasin is a basement-floored alluvial basin, cut by several east-west striking subvertical faults and a steeply dipping northwest striking fault. These faults inhibit groundwater flow perpendicular to the faults. Bedrock consists of Mesozoic quartz monzonite in the west, which has intruded older Mesozoic granite rocks and Precambrian gneissic rocks. These are exposed in the surrounding mountains and undoubtedly extend beneath the Indian Cove Subbasin. Alluvial sediments within the basin predominantly consist of alluvial fan deposits that interfinger with clay lenses and stream deposits. The sediments are dominated by sand and gravels and they become coarser and more heterogeneous near the mountain fronts. The stream valley rarely floods, suggesting that a significant part of the runoff is infiltrating into the groundwater.

Much of the groundwater flow through the Indian Cove Subbasin occurs in the easternmost part of the subbasin since 60 percent of the watershed area drains into this area. Groundwater flowing in this portion of the subbasin flows primarily along two subsurface bedrock channels that are separated by a basement high.

The depth to bedrock in the Indian Cove Subbasin varies from 100 to 1,200 feet bgs. Groundwater level depths vary from 173 to 426 feet bgs, while water level elevations measure between 2,100 and 2,400 feet. Water level declines of less than 10 feet have been observed in this subbasin (Haley & Aldrich, 2000).

3.3.2 Eastern Subbasin

The Eastern Subbasin has the largest watershed and sediment volume of the District's Subbasins. It is located south of the Twentynine Palms Valley Basin and east of the Fortynine Palms Subbasin. One of the District's production wells is in this subbasin. Groundwater supplies in the Eastern Subbasin appear to be limited with most of the flow confined to a shallow zone above or in the bedrock. The known depth to bedrock in the Eastern Subbasin varies between 160 and 750 feet bgs. Groundwater depths vary widely from 19 feet to more than 450 feet bgs, while water level elevations show less variation and are typically between

1,900 and 2,000 feet. Water level declines of between 10 and 25 feet have been observed in the Eastern Subbasin. Water in the Eastern Subbasin has higher fluoride levels than any of the other subbasins.

3.3.3 Fortynine Palms Subbasin

The Fortynine Palms Subbasin is the smallest of the District's Subbasins in volume and watershed. It is separated from the Twentynine Palms Valley Basin on the north by the Pinto Mountain Fault. The Indian Cove Subbasin lies to the west and the Eastern Subbasin to the east. Three of the District's production wells are in this Subbasin.

The known depth to bedrock in the Fortynine Palms Subbasin ranges between 168 and 430 feet bgs. Water level depths range between 176 and 258 feet bgs. Water elevations are typically around 1,950 feet. Water level declines of nearly 50 feet have been observed in the Fortynine Palms Subbasin.

3.3.4 Projected Future Water Supplies

No additional sources of water are anticipated to be available to the District in the future. Total pumping capacity of the District's wells is 6,340 gpm or a maximum of 10,248 AFY. However, due to the overdraft of the Basin, in Bulletin 118-03 DWR has recommended 1,400 AFY of pumping from each the Indian Cove and Fortynine Palms Subbasins. The District also has a pumping capacity of 490 gpm (790 AFY) from the Eastern Subbasin. This amount along with the 2,100 gpm capacity (3,395 AFY) in Mesquite Lake Subbasin yields a total of approximately 6,985 AFY of available future groundwater supply (Table 3-3). There is the potential to expand the Mesquite Lake Subbasin facilities to include another well if needed in the future. This additional well would improve reliability by allowing for redundancy in the Mesquite Lake Subbasin as well as increasing pumping capacity.

TABLE 3-3
GROUNDWATER PUMPING CAPACITY

Basin Name	Pumping Capacity (gpm)	Pumping Capacity (AFY)
Mesquite Springs Basin[(a)]	2,100	3,395
Joshua Tree Basin		
Fortynine Palms Subbasin[(b)]	870	1,400
Eastern Subbasin[(a)]	490	790
Indian Cove Subbasin[(b)]	870	1,400
Total	**4,330**	**6,985**

Notes:
(a) Pumping capacity of Twentynine Palms Water District
(b) DWR recommended pumping limit to prevent overdraft

3.4 Adopted Groundwater Management Plan

As part of legislation authorizing Twentynine Palms to provide retail water service to individual municipal customers, Assembly Bill (AB) 134 (2001) includes a requirement that TPWD prepare a GWMP in accordance with the provisions of Water Code Section 10753, which was originally

enacted by AB 3030. The District adopted a GWMP in 2008 and a copy is included on compact disc in Appendix C and on the District's website at http://www.29palmswater.org/pdf/GWMP.pdf.

A GWMP must contain Basin Management Objectives that define quantitative goals and thresholds for groundwater level, groundwater quality, inelastic land surface subsidence, and surface water levels and quality. Additionally, a GWMP must contain a monitoring program capable of tracking changes in conditions for the purpose of meeting the BMOs.

3.4.1 Safe Yield, Overdraft and Recharge

According to DWR, safe yield is "the maximum quantity of water that can be continuously withdrawn from a ground water basin without adverse effect" (DWR, 1975). A groundwater basin's maximum safe yield is therefore approximately equivalent to or less than the basin's annual net groundwater recharge.

DWR defines overdraft as "the temporary condition of a ground water basin where the amount of water withdrawn by pumping exceeds the amount of water replenishing the basin over a period of time" (DWR, 1975). Significant groundwater overdraft has the potential to result in adverse impacts, including ground surface subsidence, degraded water quality, falling water table, and increased pumping costs.

DWR Bulletin 118-03 estimates total storage capacity of the Joshua Tree Basin to be 2,540,000 acre-feet (AF) using an estimated area of 33,800 acres, specific yield of 15 percent, and an average thickness of basin material of 500 feet. This estimate applies to the entire groundwater basin, and not just the overlying area which the District manages. Groundwater in storage was estimated to be 1,010,000 AF. Actual groundwater extractions in the Joshua Tree Basin are measured by the Joshua Basin Water District. Data suggest that extractions between 1985 and 1995 were over 50 percent more than natural recharge and that groundwater levels have dropped by an average of 1 foot per year since about 1973. Currently, there is no available data specific to the Indian Cove, Fortynine Palms, and Eastern Subbasins, which are the portions of the Joshua Tree Basin managed by the District.

Storage capacity of the entire Twentynine Palms Valley Basin, also known locally as the Mesquite Basin, is estimated in Bulletin 118-03 as 1,420,000 AF. The total amount of groundwater available in the basin was estimated to be 132,000 AF in 1984. The basin is considered to be in overdraft, as the estimated annual rate of groundwater depletion is 1,500 AF while recharge is only 300 AF. Additionally, the Colorado River Basin Plan identifies the Twentynine Palms Valley Subunit of the Dale Hydrologic Unit as being an area where overdraft and increase of mineral content (particularly fluoride) of the groundwater are concerns (California Regional Water Quality Control Board and State Water Resources Control Board, 1994). The District overlies and only pumps from the southern portion of this basin. Within the Joshua Tree Basin, long-term water level declines in excess of 50 feet are evident south of the Pinto Mountain Fault throughout the Indian Cove and Fortynine Palms Subbasins. Water level declines of more than 85 feet have occurred near pumping centers of both subbasins.

Long-term historic declines have also occurred in the Eastern Subbasin near the District's well field. These declines have ranges between 20 to 40 feet. Minimal water level declines have been observed north of the Pinto Mountain Fault, within the Twentynine Palms Valley Basin.

Recharge of the groundwater occurs when the limited rainfall in the area percolates through the soil into the aquifer. The primary mechanisms of groundwater recharge are the high-energy surface runoff from the mountains and subsequent infiltration into the mountain-front alluvial fans, and the infiltration of precipitation into fractured bedrock exposed in the mountains. Direct precipitation on the valley floor provides little water to the groundwater system because of adsorption by the soil and subsequent rapid evaporation. Summertime rainstorms over Joshua Tree National Park result in limited recharge for the alluvial fans that extend out to the desert floor. Additionally, a major portion of the runoff collects in the dry lakebeds to the east of the City, where it percolates into the groundwater table. However, the soils in this area are high in fluoride, which is dissolved in the groundwater during percolation. The high fluoride content renders the groundwater unusable for potable purposes without treatment.

Geothermal discharge from major fault systems underlying the subbasins has occurred for many millions of years and adds a small amount of water to the groundwater system. This water commonly contains high levels of fluoride and can contaminate otherwise potable water from other sources. Consequently, fluoride minerals precipitated by these waters have been trapped in the thick deposits of clays, which are found dispersed throughout the alluvium in the subbasins.

When there is a significant increase in groundwater flow, as there is near a pumping well, some of this fluoride from the sediment goes into solution producing fluoride levels above state standards. Some of the groundwater produced and delivered to customers, returns to the subbasins through infiltration and percolation of irrigation water and of septic tank discharges.

Groundwater recharge resulting from return water has the potential to gradually degrade water quality. There are no artificial recharge operations in the District at this time. The calculation of recharge volume, storage volumes, and safe yields can vary based on the input data and methodology. In 1984, DWR utilized theoretical calculations to calculate volumes in storage and they demonstrated the estimated life for each subbasin. From this theoretical calculation, overdraft of both Indian Cove and Fortynine Palms Subbasins should cease if the maximum extraction rate were reduced to approximately 1,400 AF per subbasin per year (California Department of Water Resources, 1984).

Annual recharge for the Indian Cove Subbasin of 2,500 AF was estimated by using runoff data calculated from the precipitation data for the entire basin over a 29-year period. In 1990, the overdraft was estimated to be 200 acre-feet per year (AFY) for the Indian Cove Subbasin. The total calculated volume of groundwater in storage for the subbasin is 83,000 AF with about 65,000 AF within the lower aquifer (2,000 to 2,200 feet elevation) and only about 18,000 AF within the upper aquifer (above 2,200 feet elevation) (BCI Geonetics, Inc., 1990). Additionally, BCI Geonetics postulated that the decline in water level in the Indian Cove Subbasin may be only partially due to overpumping. It is possible that the pumping wells are not receiving recharge from the entire subbasin because they are isolated from the recharge zones by faults. Additional reasons for groundwater level decline include long-term regional decline, subsidence related to recent tectonics, geothermal circulation, and compartmentalization.

3.5 Basin Management Objectives

The goals of the District's GWMP are to provide the District with increased management authority over its local groundwater resources and to more effectively manage its limited

groundwater resources. In order to do so, the District established BMOs: specific, measurable accomplishments that must be completed to meet the goals. These BMOs establish the water level and water quality conditions that are acceptable in the basin and address conditions that need to be remedied. The BMOs established for the Twentynine Palms Water District are:

- BMO #1 - Minimize long-term drawdown of groundwater levels
- BMO #2 – Maintain groundwater quality
- BMO #3 – Monitor and track groundwater levels, quality, and storage
- BMO #4 – Reduce water consumption through water conservation
- BMO #5 – Facilitate groundwater replenishment projects
- BMO #6 – Identify and obtain funding for groundwater projects

Within the GWMP, three factors affect the availability of groundwater supplies: 1) sustainability of the groundwater resource to meet pumping demand on a renewable basis; 2) water quality issues from fluoride and TDS, and 3) protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. BMOs 1, 3, 4, and 5 are briefly discussed as follows, and more completely addressed in Appendix B. The impacts of water quality and reliability are addressed in Chapter 5. Twentynine Palms is dependent on groundwater and to maintain reliability of that source, the District must implement the BMOs to meet demand. Tables 3-4 and 3-5 show the historical and projected amounts of groundwater pumping. The District expects growth, albeit slow. Overdraft is considered a challenge for reliability of supply and is addressed in the Groundwater Management Plan.

TABLE 3-4
HISTORIC AMOUNT OF GROUNDWATER PUMPED (AF)

Basin Name (s)	2005	2006	2007	2008	2009	2010
Mesquite Springs Basin	798	787	814	940	969	927
Joshua Tree Basin						
Fortynine Palms Subbasin	950	1,021	1,090	908	987	1,099
Eastern Subbasin	263	339	516	458	530	405
Indian Cove Subbasin	1,142	1,193	908	691	637	546
Total	**3,152**	**3,340**	**3,328**	**2,998**	**3,123**	**2,977**
% of Total Water Supply	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

TABLE 3-5
AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED (AF)

Basin Name(s)	2015	2020	2025	2030	2035
Mesquite Springs Basin	1,179	1,308	1,404	1,499	1,588
Joshua Tree Basin					
Fortynine Palms Subbasin	1,202	1,333	1,431	1,528	1,619
Eastern Subbasin	645	716	768	820	869
Indian Cove Subbasin	775	859	922	985	1,044
Total	**3,801**	**4,216**	**4,525**	**4,833**	**5,119**
% of Total Water Supply	**100%**	**100%**	**100%**	**100%**	**100%**

Long term water declines in the Joshua Tree Basin have been observed. Therefore the District has historically used only these three Subbasins for groundwater production:

1. The Eastern Subbasin only provides water through a single well.
2. The Fortynine Palms Subbasin is also impaired by declining water levels, with historical declines of about 10 feet per year.
3. Groundwater levels in the Indian Cove Subbasin are currently increasing.

In the past, water was not produced from the Twentynine Palms Valley Basin due to high fluoride concentrations.

In order to continue to analyze current groundwater conditions and track changes in the groundwater basin resulting from active management activities, the District maintains regular groundwater level and quality monitoring to improve the understanding of groundwater level fluctuations, potential impacts to groundwater quality, and changes in groundwater storage across the three subbasins of interest. Changes to groundwater storage will be accounted for by tracking groundwater levels. The District currently conducts water quality monitoring per California Department of Public Health standards which is sufficient for the purpose of tracking changes in the groundwater basin.

In order to reduce groundwater overdraft, the amount of recharge experienced by the District's Subbasins could be increased through "artificial recharge." Since the District does not have access to imported surface or recycled water sources, the only source of water for replenishment is the impoundment or collection of runoff. Therefore, groundwater replenishment should be increased by maximizing the use of the only source of recharge available (precipitation) by providing recharge enhancement.

Better management of the District's groundwater supplies alone does not provide a complete solution to declining water levels in the District's service area. The District does not have access to imported water sources, and is restricted in its ability to recharge its basins. While the District's residential water use is relatively low at 0.31 AFY per household, savings in residential water use could be accomplished through additional conservation efforts. The District could implement more aggressive water conservation efforts to reduce demand for groundwater resources and pumping in the region.

3.6 Transfer and Exchanges

Imported water from either MWD or MWA does not appear to be a viable option for the District. The District is not within the service area of either agency. MWD's closest facilities are more than 45 miles southwest of the District; MWA's facilities extend no closer to the District than Yucca Valley, approximately 23 miles west of the District. The District Board has on two occasions voted against extending imported water service to the District. At this time, there are no other opportunities for the District to transfer or exchange water.

3.7 Planned Water Supply Projects and Programs

No additional sources of water are anticipated to be available to the District in the future as the nearest supply is over 45 miles away and sufficient supply exists. Existing, total pumping

capacity of the District's wells is 6,340 gpm or a maximum of 10,248 AFY although the District pumps well below that level. Current pumping capacity, which is limited by DWR's recommendations to prevent overdraft, is sufficient to meet the projected demand in 2035 without expansion. However, the District continues to evaluate the potential of expanding infrastructure to meet future demands exceeding current projections should that occur. There is the potential to expand facilities in the Mesquite Lake Subbasin to include another well if needed in the future. This additional well would improve reliability by allowing redundancy in the Mesquite Lake Subbasin as well as increasing pumping capacity. Also, as part of the GWMP, recharge enhancement will further improve the reliability and may lead to an increase for the 1,400 AFY DWR pumping recommendation of the Fortynine Palms Subbasin and Indian Cove Subbasin.

3.8 Development of Desalination

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). Desalination is not currently anticipated to be a potential future water source because the District is not near any potential source of water for desalination (i.e., ocean, brackish water bodies, or high TDS groundwater). Furthermore, there is no cost-effective means for brine disposal from a potential desalination facility at this time.

Section 4: Recycled Water

The District does not have a municipal sewer system nor a wastewater treatment plant. At this time all residential and non-residential accounts use septic tank systems for the disposal of wastewater. The construction of a centralized system has been deemed infeasible by local jurisdictions. Alternatively, the District has considered partnering with other agencies; however, the nearest water agency is 25 miles away and an intertie is cost prohibitive at this time. Therefore, at this time there are no opportunities for water recycling or programs that include recycled water.

In 2008 the City of Twentynine Palms commissioned a report to study the feasibility of a centralized wastewater system. The report recommended a decentralized system that relies on the Marine Corps Station sewage facilities. The cost of the system was estimated between $55 and $80 million in capital costs. As the District is rural and has slow growth, the cost was deemed prohibitive. The study proposed a phased approach with final completion of sewage system in 2040 to mitigate the cost.

The District recognizes the importance of recycled water and water reliability; however, due to the small size of the system, low annual demand and the use of individual septic systems, a recycled water system is not a feasible solution. As an alternative the District will invest in water conservation approaches to reduce demand and compensate for the lack of recycled water. As water is primarily used on landscape, the District has developed approaches to emphasize outdoor water conservation.

4.1 Potential Users

The 2010 Technical Reports to support the General Plan of the City of Twentynine Palms show that 93 percent of the 7,000 connections are residential. A portion of the water delivered is used for landscape irrigation. Therefore the City has determined the largest user of recycled water will be residential landscape should a plan for a centralized sewage treatment system be accepted. A recycled water system would not be considered until 2040.

Section 5: Water Quality

The quality of any natural water is dynamic in nature. This is true of local groundwater basins with the quality of water changing over the course of a year. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and pumping. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the CDPH. An annual Consumer Confidence Report (CCR) is provided to all residents who receive water from the District. That report includes detailed information about the results of quality testing of the water supplied during the preceding year (CCR, 2009). The quality of water received by individual customers will vary depending on whether the ground water is blended and the predominant basin which is pumped.

This section provides a general description of the water quality of the groundwater supplies, aquifer protection, and a discussion of potential water quality impacts on the reliability of these supplies.

Water quality in the basin is not as good as in the Joshua Tree Basin. Fluoride levels are higher, above 10 milligrams per liter (mg/L) in some places and between 3 and 10 mg/L throughout the rest of the basin. Total dissolved solids (TDS) levels vary, with most of the basin having between 500 and 800 mg/L. In some areas of the basin, TDS levels of more than 800 mg/L have been observed (Haley & Aldrich, 2000). The District has one high-capacity production well in the Twentynine Palms Valley Basin which is used to supply the Fluoride Removal Water Treatment Plant.

5.1 Water Quality

District groundwater is typically of good quality, although there are concerns about high levels of both fluoride and TDS in specific areas of the District. Additionally, the historic and current use of septic tank systems for wastewater disposal may have a negative effect on groundwater quality. The District's 2009 Consumer Confidence Report indicates the groundwater meets federal and state MCL standards. Source Water Assessments for nine (9) active wells were completed in April 2002. The newest (tenth) well was installed in 2009 and a Source Water Assessment was performed in 2007.

5.2 Potable Water Quality

Septic systems discharge their effluent into constructed permeable leach fields and/or to the shallow soil, where they are treated by biological organisms in the soil and/or degraded by other natural processes over time. Septic effluent is characterized by concentrations of ammonia, chloride, phosphorus, sodium, potassium, boron, volatile organic compounds, and bacteria that

are higher than that in the native groundwater. Additionally, groundwater may be contaminated by releases from septic systems when systems are poorly designed (tanks are installed in areas with inadequate soils or shallow depth to ground water); poorly constructed or sealed; are improperly used, located, or maintained; or are abandoned (District, 2001).

5.2.1 Water Quality Constituents

All water purveyors are subject to drinking water standards set by the US EPA and the CDPH. The District is committed to providing its customers with high quality water that meets all federal and state primary drinking water standards. Although the District supplies its customers with high quality water, it recognizes that improving technology and science will continue to impact the evolving nature of state and federal standards. Below are constituents that represent a summary of constituents in the 2009 CCR and the Groundwater Management Plan that may impact water reliability.

5.2.1.1 Fluoride

The soils in the District service area are high in fluoride, which is dissolved in the groundwater during percolation. The high fluoride content renders the groundwater unusable for potable purposes without treatment. Fluoride concentrations increase when stormwater runoff percolates through soils with naturally elevated levels of fluoride. Fluoride concentrations range between 0.34 to 2.7 mg/L in the District as reported by the CCRs with the lowest fluoride concentrations present in the area south of the Pinto Mountain Fault and the highest concentrations in the northern half of the District (District, 2000). On average the fluoride level is 1.43 mg/L. Water quality in the Indian Cove Subbasin is typically good, however, fluoride concentrations tend to increase with increasing groundwater temperature. As regional water temperatures decrease southward so does the associated higher fluoride concentrations.

Geothermal discharge from major fault systems underlying the subbasins has occurred for many millions of years and provides an additional source of fluoride to the groundwater system. This water commonly contains high levels of fluoride and can contaminate otherwise potable water from other sources. Consequently, fluoride minerals precipitated by these waters have been trapped in the thick deposits of clays, which are found dispersed throughout the alluvium in the subbasins. When there is a significant increase in groundwater flow, as there is near a pumping well, some of this fluoride from the sediment goes into solution producing fluoride levels above State standards.

Fluoride concentrations within the District are intermediate with respect to regional values, but are generally higher than the MCL of 2 mg/L. The District has received a fluoride variance allowing it an MCL of 3 mg/L. This variance sunsets in 2023.

The District has already made strides toward balancing demands on the various subbasins with construction of the Twentynine Palms Fluoride Removal Water Treatment Plant, which currently pumps 1.0 MGD from the Twentynine Palms Valley Basin. The plant removes fluoride to levels below the MCL, allowing it to be used for drinking water. With the operation of the Fluoride Removal Water Treatment Plant, a portion of the District's water demand can be shifted away from the Joshua Basin to the Twentynine Palms Valley Basin. Since the Fluoride Removal Water Treatment Plant came online, water declines in the Fortynine Palms Subbasin have slowed to approximately 5 feet per year. The plant will ultimately have 3.0 million gallons per

day (MGD) capacity and also includes the flexibility to remove arsenic and radon, if it becomes necessary to do so.

5.2.1.2 Total Dissolved Solids and Salts

The TDS content of groundwater within the District ranges from about 100 to 350 mg/L. Lowest TDS concentrations usually occur south of the Pinto Mountain Fault, with a wide range of values occurring east of the Mesquite Fault (CCR, 2009, District, 2000). Groundwater TDS concentrations typically increase through natural mineral resources and recharge of septic effluent but remains below the CDPH secondary MCL limit of 500 mg/L.

The groundwater south of the Pinto Mountain Fault is bicarbonate type with a low TDS and calcium and sodium as the predominant cations. Groundwater between the Mesquite and Pinto Mountain Faults is also bicarbonate type, with sodium as the primary cation. The central and western portions of the Mesquite Lake Subbasin have sodium-sulfate type water. East of the Mesquite Fault, the water type varies considerably from sodium-bicarbonate to sodium-sulfate (District, 2000). Due to these various sources of natural minerals, the District monitors this constituent for the potential of elevated levels.

5.3 Groundwater Quality

The District has four sources of groundwater, the Indian Cove Subbasin, Eastern Subbasin, Fortynine Palms Subbasin, and Mesquite Lake Basin.

Local groundwater generally does not have microbial water quality problems. Parasites, bacteria, and viruses are filtered out as the water percolates through the soil, sand, and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped by wells to protect public health due to the many septic tanks that may be a source of microbial contamination. Local groundwater has very little total organic carbon (TOC) and generally has very low concentrations of bromide, minimizing potential for disinfection by-product (DBP) formation. Taste and odor problems from algae are not an issue with groundwater. Overall, all groundwaters meet or exceed drinking water standards.

5.3.1 Subbasin Water Quality

In a report commissioned by the District in 2000, the groundwater quality of each basin was assessed. As the growth and development of the region is minimal and has not changed much since this report was produced, it is assumed that the water quality of the subbasins will not have changed significantly.

5.3.2 Indian Cove Subbasin

Water quality in the Indian Cove Subbasin is typically good. Typically, fluoride concentrations tend to increase with increasing groundwater temperature. Regional water temperatures decrease southward; associated higher fluoride concentrations also decrease. Fluoride concentrations within the District are intermediate with respect to regional values, but are generally higher than the MCL of 2 milligrams per liter (mg/L), with fluoride levels in the Indian Cove Subbasin below 3 mg/L. TDS levels are approximately 250 mg/L. The secondary MCL for TDS is 500 mg/L (District, 2000).

5.3.3 Eastern Subbasin

Water in the Eastern Subbasin has elevated fluoride levels, especially near Well No. 1 (typically between 3 and 8 mg/L). Therefore Well No. 1 is not used for potable water at this time. Fluoride levels near Well No. 16, however, are typically below 2 mg/L. Thus Well No. 16 (490 gpm pumping capacity) can still be used for potable water purposes; however, it is vulnerable to septic and activities associated with higher populations.

5.3.4 Fortynine Palms Subbasin

Water quality in the Fortynine Palms Subbasin is similar to that of the Indian Cove and Eastern Subbasins, with fluoride levels below 3 mg/L and TDS levels below 250 mg/L (District, 2000). The two wells located in this Basin are also vulnerable to septic tanks and higher population centers.

5.3.5 Mesquite Lake Subbasin

In the Mesquite Lake Subbasin, fluoride levels are higher, above 10 mg/L in some places and between 3 and 10 mg/L throughout the rest of the subbasin.

5.4 Aquifer Protection

The region has generally a low density population and minimal industry; therefore, the aquifers are not expected to be impacted significantly. Water quality is monitored and the largest threat to the aquifers is the septic tanks in the region.

5.5 Water Quality Impacts on Reliability

Three factors affect the availability of groundwater: 1) sufficient source capacity (wells and pumps); 2) sustainability of the groundwater resource to meet pumping demand on a renewable basis; and 3) protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two of those factors are addressed in previous chapters. The resolution of elevated fluoride levels has been addressed with an allowed variance. The District maintains acceptable levels of fluoride through the use of wells with lower levels of fluoride being pumped as much as possible when water demand on the system dictates. In April 2004, the Department of Public Health issued a permit to the District allowing full operation of the Fluoride Removal Plant, which currently is producing approximately one million gallons a day (1 MGD) of potable drinking water. The plant extracts water from the Mesquite Springs Basin to remove high levels of naturally occurring fluoride. This aquifer is a significant source of water for the District and on-going studies will determine future production rates from the plant to better manage groundwater resources. Other water quality constituents are not expected to impact reliability (Table 5-1).

TABLE 5-1
CURRENT AND PROJECTED WATER SUPPLY CHANGES
DUE TO WATER QUALITY-PERCENTAGE CHANGE

Water source	2010	2015	2020	2025	2030
Groundwater					
Indian Cove Subbasin	0%	0%	0%	0%	0%
Eastern Subbasin	0%	0%	0%	0%	0%
Fortynine Palms Subbasin	0%	0%	0%	0%	0%
Mesquite Lake Subbasin	0%	0%	0%	0%	0%

Section 6: Reliability Planning

The Act requires urban water suppliers to assess water supply reliability that compares total projected water used with the expected water supply over the next twenty years in five-year increments. The Act also requires an assessment for a single-dry year and multiple-dry years. This section presents the reliability assessment for the Twentynine Palms Water District service area.

It is the stated goal of Twentynine Palms to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

6.1 Reliability of Water Supplies

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of supplies to the Basins. According to DWR, safe yield is "the maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect" (DWR, 1975). A groundwater basin's maximum safe yield is therefore approximately equivalent to or less than the basin's annual net groundwater recharge.

DWR defines overdraft as "the temporary condition of a ground water basin where the amount of water withdrawn by pumping exceeds the amount of water replenishing the basin over a period of time" (DWR, 1975). Significant groundwater overdraft has the potential to result in adverse impacts, including ground surface subsidence, degraded water quality, falling water table, and increased pumping costs.

Long-term water level declines in excess of 50 feet are evident south of the Pinto Mountain Fault throughout the Indian Cove and Fortynine Palms Subbasins. Water level declines of more than 85 feet have occurred near pumping centers of both Subbasins. Long-term historic declines have also occurred in the Eastern Subbasin near the District's wellfield. These declines have ranged between 20 to 40 feet. Minimal water level declines have been observed north of the Pinto Mountain Fault, within the Mesquite Lake Subbasin (District, 2000).

DWR Bulletin 118 identifies the Twentynine Palm Basins as having evidence of overdraft. Similarly, the Colorado River Basin Plan identifies the Twentynine Palms Subunit of the Dale Hydrologic Unit as being an area where overdraft and increase of mineral content of the groundwater are concerns (California Regional Water Quality Control Board, 1994).

In order to improve water quality and prevent future overdraft, the District constructed a high capacity well (3,395 AFY) and fluoride treatment removal plant in the Mesquite Lake Subbasin, with plans for a second well. This project provides the necessary treatment, allows for more balanced pumping of the basins, and reduces the likelihood of overdraft, thereby improving overall water supply reliability for the District.

The slow growth, fluoride removal, and implementation of the Groundwater Management Plan of the two basins will ensure a reliable future water supply for the service area. A summary of the factors limiting supplies is found in Table 6-1.

TABLE 6-1
FACTORS RESULTING IN INCONSISTENCY OF SUPPLY

Water supply sources	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Supplier produced groundwater		None			X	X	Groundwater contains high fluoride from geothermal discharge. A treatment process has been implemented. The basins are depended on annual run-off and precipitation in the mountains.

6.2 Normal, Single-Dry, and Multiple-Dry Year Planning

Twentynine Palms Water District uses groundwater water supplies with various recharge paths to meet demands during normal, single-dry, and multiple-dry years. The following sections elaborate on the supply to meet demand in normal, single dry and multiple dry year planning.

6.2.1 Groundwater

Supplies available from local groundwater are 6,985 AFY based on the ultimate production capacity. In average/normal years, a supply of 3,800 to 5,100 AFY is the projected supply needed to meet demand. In a single dry year, the projected supply needs range from 3,900 to 5,300 AFY, which is still well below the production capacity and protective of overdraft of the basins. Even during multiple dry year periods, demand will be met with supply needs ranging from 3,800 to 5,400 AFY. In addition, water conservation activities during dry years will likely help to minimize increases in dry year demands. Table 6-2 shows the supply reliability of current water sources.

TABLE 6-2
SUPPLY RELIABILITY-CURRENT WATER SOURCES (AFY)

Water Supply Sources	Average/Normal Water Year Supply	Single Dry Water Year Supply[(a)]	Multiple Dry Water Year Supply			
			1	2	3	4
Supplier produced potable groundwater	3,801	3,915	3,915	3,993	4,073	4,155
Total	3,801	3,915	3,915	3,993	4,073	4,155
Percent of Normal Year		103%	103%	105%	107%	109%

Note:
(a) Supply increases based on 2010 demand and a 2% demand increase in each of the three dry year for a multiple dry water supply (a conservative assumption). The single dry year was estimated at 3% increase which represents a conservative estimate. The first year of the multiple dry year analysis was assumed to be the same as the single dry water year.

6.3 Supply and Demand Comparisons

The available supplies and water demands for the Twentynine Palms Water District service area were analyzed to access the region's ability to satisfy demands during three scenarios: a normal water year, single-dry year, and multiple-dry years. The tables in this section present the supplies and demands for the various drought scenarios for the projected planning period of 2010-2035 in five year increments. Table 6-3 presents the base years for the development of water year data. The two main basins depend on recharge from run-off in the local mountains and some geothermal discharges into the basins. The Basin Management Objectives in Section 3 describe the mechanisms used to ensure that overdraft of the basin does not occur. This is accomplished though conservation, tracking storage and pumping, and support of replenishment projects. Tables 6-4, 6-5, and 6-6 summarize, respectively, Normal Water Year, Single-Dry Water Year, and Multiple-Dry Year supplies and demands.

The supply and demand comparisons do not include demand reductions due to conservation measures which will increase reliability. Data in these tables indicate that Twentynine Palms Water District has sufficient water supply to meet water demands through 2030. It is not anticipated that existing water quality trends would impact the District's groundwater supply over the next twenty-five years.

TABLE 6-3
BASIS OF WATER YEAR DATA

Water Year Type	Base Years
Normal Water Year	2004[(a)]
Single-Dry Water Year	2002[(b)]
Multiple-Dry Water Years	1949-1951; 2000-2002[(b)]

Notes:
(a) From peak stream flows data based on USGS station 10260950 near Hesperia (Data between 1975-2009) http://waterdata.usgs.gov/ca/nwis/current/?type=flow&group_key=county_cd
(b) From peak stream flows data based on USGS station 10260500 near Hesperia (Data between 1905-2009) http://waterdata.usgs.gov/ca/nwis/current/?type=flow&group_key=county_cd

6.3.1 Normal Water Year

Table 6-4 summarizes the District's water supplies available to meet demands over the 25-year planning period during an average/normal year.

TABLE 6-4
SUPPLY AND DEMAND COMPARISON-NORMAL YEAR (AFY)

	2010	2015	2020	2025	2030	2035
Supply totals	3,663	3,801	4,216	4,525	4,833	5,119
Demand totals	2,674	3,801	4,216	4,525	4,833	5,119
Difference	989	0	0	0	0	0
Difference as % of supply	27%	0%	0%	0%	0%	0%
Difference as % of demand	37%	0%	0%	0%	0%	0%
Production Capacity	**10,248**	**10,248**	**10,248**	**10,248**	**10,248**	**10,248**

6.3.2 Single-Dry Year

The water supplies and demands for Twentynine Palms Water District service area over the 25-year planning period were analyzed in the event that a single-dry year occurs, similar to lower flows and run-off experienced in 2002. Table 6-5 summarizes the existing and planned supplies available to meet demands during a single-dry year. Demand during dry years was assumed to increase by 3 percent for each 5 year period based the percent increase in production for the water year 2002 as compared to a normal year represented by 2004.

TABLE 6-5
SUPPLY AND DEMAND COMPARISON-SINGLE DRY YEAR (AFY)

	2010	2015	2020	2025	2030	2035
Supply totals	3,663	3,915	4,342	4,661	4,978	5,273
Demand totals	2,674	3,915	4,342	4,661	4,978	5,273
Difference	989	0	0	0	0	0
Difference as % of supply	27%	0%	0%	0%	0%	0%
Difference as % of demand	37%	0%	0%	0%	0%	0%
Production Capacity	**10,248**	**10,248**	**10,248**	**10,248**	**10,248**	**10,248**

6.3.3 Multiple-Dry Year

The water supplies and demands for Twentynine Palm's service area over the 25-year planning period were analyzed in the event that a multiple-dry year event occurs. The water years representing multiple dry years were 1949-1951 and more recently 2000-2002 based on peak stream flows from the nearest monitoring station around Hesperia. Table 6-6 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Demand during dry years was assumed to increase by 1, 2 and 3 percent for each of the dry years, respectively. The percent was calculated based on the percent increase in production for the water years 2000, 2001, and 2002 as compared to a normal year represented by 2004.

TABLE 6-6
SUPPLY AND DEMAND COMPARISON-MULTIPLE DRY-YEAR EVENTS (AFY)

		2010	2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supply totals	3,663	3,839	4,258	4,570	4,881	5,170
	Demand totals	2,674	3,839	4,258	4,570	4,881	5,170
	Difference	989	0	0	0	0	0
	Difference as % of supply	27%	0%	0%	0%	0%	0%
	Difference as % of demand	37%	0%	0%	0%	0%	0%
Multiple-dry year second year supply	Supply totals	3,663	3,915	4,342	4,661	4,978	5,273
	Demand totals	2,674	3,915	4,342	4,661	4,978	5,273
	Difference	989	0	0	0	0	0
	Difference as % of supply	27%	0%	0%	0%	0%	0%
	Difference as % of demand	37%	0%	0%	0%	0%	0%
Multiple-dry year third year supply	Supply totals	3,663	4,029	4,469	4,797	5,123	5,426
	Demand totals	2,674	4,029	4,469	4,797	5,123	5,426
	Difference	989	0	0	0	0	0
	Difference as % of supply	27%	0%	0%	0%	0%	0%
	Difference as % of demand	37%	0%	0%	0%	0%	0%
Production Capacity		**10,248**	**10,248**	**10,248**	**10,248**	**10,248**	**10,248**

6.3.4 Summary of Comparisons

As shown in the analyses above, Twentynine Palms Water District has adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 25-year planning period. There is no difference in the supply and the demand since the local groundwater supplies will be pumped according to the demand. In addition, as shown in Table 3-3 and the tables above, there is more than sufficient production capacity to meet future demands.

Section 7: Water Demand Management Measures

This section describes the water Demand Management Measures (DMMs) implemented within the District as part of the effort to reduce water demand.

7.1 Background

The District recognizes that conserving water is an integral component of a responsible water strategy. The District has a uniquely low water use compared with its neighbors. At 127 gallons gpcd, the District is significantly lower than the rest of the Colorado River region, which has a 10-year average baseline of 346 gpcd, and has already met its SBX7-7 goal of 139 gpcd in 2020. The District has achieved its goals largely by focusing on system performance, rates increases and a community culture of conservation and small landscapes. The District is committed to providing its customers with the education and tools to maintain their low use.

7.2 Implementation of Demand Management Measures (DMMs)

The DMMS specified in the UWMP Act are the same as the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). Although the District is not a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU), the UWMP Act requires compliance with the DMMs.

The MOU and BMPs were revised by the CUWCC in 2008. The revised BMPs now contain a category of "Foundational BMPs" that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs, and water waste ordinances) and Public Education (public outreach and school education programs). The remaining "Programmatic" BMPs have been placed into three categories: Residential, Large Landscape, and Commercial, Industrial, Institutional Programs. These revisions are reflected in the DMM compliance requirements for the 2010 UWMP's (Section E).

The District is implementing all of the Foundational DMMs as required in the revised MOU and UWMP Act. The Programmatic DMMs are being implemented through a DMM approach.

The following sections describe the various programs and conservation activities implemented by the District.

7.2.1 Foundational DMMs

7.2.1.1 Utility Operations

7.2.1.1.1 Operations Practices

a. Conservation Coordinator

The District's conservation program is run by the Operations Manager; program implementation includes meter reading and customer services staff.

b. Water Waste Prevention

The District does not have rule making authority, however it supports water waste prevention activities and ordinances through both direct Board activities and in collaboration with the City of Twentynine Palms (City).

In April 2010 the Board of Directors of the District signed Resolution No. 10-03 (Appendix D) proclaiming the month of May as Water Awareness Month in the community of Twentynine Palms to help increase public awareness of water issues and conservation. The resolution encourages residents and businesses to help protect water resources by practicing water saving measures and becoming more aware of the need to save water.

The District is also actively supporting the City in establishing terms of service for water efficient fixtures and design as required by state law. The City has adopted AB 1881 by statute and is enforcing Cal Green requirements through building permits. In February 2011 the District adopted Resolution 11-02 (Appendix E) supporting the Model Landscape Water Ordinance and the CAL Green building standards. The District has developed processes to ensure water service is provided only after the proper approval and permits have been issued and notification has been provided by the City that all water efficiency related requirements are met.

The District also has a Water Shortage Contingency Plan (from the 2005 UWMP) that identifies three stages of water shortage and District response.

7.2.1.1.2 Water Loss Control

The District has focused significant efforts on water loss control through replacement of aging infrastructure and controlling water loss in the distribution system. Through the District pipeline replacement program, which ran from 1991 through 2004, and other District maintenance programs, all 200 miles of District pipelines have been replaced and are being surveyed each year. The District reviews telemetry graphical data daily showing well and pump run times and reservoir levels that can indicate leaks. As a newer system, the District does not experience a significant amount of water loss. Table 7-1 provides a summary of the number of leaks detected and repaired and indicates a significant decline in the number of leaks within the District's distribution system since the implementation of the pipeline replacement program.

TABLE 7-1
LEAKS

	2005	2006	2007	2008	2009	2010
Water leaks	11	17	5	2	6	2

The District has completed AWWA's M36 Water Loss analysis (Appendix F) which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. The District's Infrastructure Leakage Index (ILI) is 0.77. The results indicate that the District is successfully controlling its losses. District staff will evaluate the improvement opportunities recommended in the result.

7.2.1.1.3 Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

All of the District's customers are metered and billed by volume.

7.2.1.1.4 Retail conservation pricing (formerly DMM 11)

July 2011 will mark the final stage of the District's three-year rate increase. The ratio of fixed to variable charges has ranged from about 30 to 33 percent since 2005 (Table 7-2); the average is 31.3 percent. The District expects that the upcoming rate increase in July 2011 will lower the ratio of fixed costs to consistently meet the 30 percent threshold required by the DMMs.

TABLE 7-2
REVENUES

	Fiscal Year					
	2011	**2010**	**2009**	**2008**	**2006**	**2005**
Ratio of Fixed to Total Charges (%)	29.7	32.4	32.6	32.2	30.7	30.4

7.2.1.2 Education

7.2.1.2.1 Public Information Programs

In order to communicate with its customers the District maintains an active Conservation section on its website with tips, information on native plants, a water wise brochure and other helpful information.

In coordination with the California Water Awareness Campaign, the District observed the month of May 2010 as "Water Awareness Month". In preparation for this observance, the District worked to promote public awareness about the vital role of water and the importance of its conservation and protection. Helpful tips were included in each water bill and a brochure highlighting water conservation and protection ideas was developed and distributed at the Water Department, Twentynine Palms City Hall, City Library and the Chamber of Commerce.

The District plans to initiate quarterly contact with its customers on their water bills, providing tips and a reminder to conserve, in fiscal year 2011. The District is also planning to build a landscape demonstration garden in 2011. The garden will be accompanied by materials on water smart landscape design and irrigation.

7.2.1.2.2 School Education Programs

The District feels the best way to develop wise users of its resources is through education. The District offers support and materials to teachers in the Twentynine Palms area within District boundaries from lesson plans to classroom presentations.

The District conducts elementary school presentations informing students about the local water supply and the importance of water conservation and protection. The presentations are designed to support grade level state curriculum standards and to assist students in discovering basic water concepts. The presentations consist of lecture, short videos, discussion, and classroom activities. All classes cover grade appropriate information on water sources, source

protection and conservation. In addition, individual grade level presentations address California water history, the earth's fresh water supply, the water cycle and drinking water treatment, and water as a material resource and how it is used to make common objects.

In coordination with the District's water education program and the California Water Awareness Campaign, the District also sponsors an annual poster contest that is open to all 4th, 5th, and 6th grade students. The purpose of the poster contest is to promote public awareness about water conservation and protection.

An average of 15 to 20 classroom programs are conducted each year at no cost to participating schools within the Twentynine Palms Water District service area.

7.2.2 Programmatic DMMs

7.2.2.1.1 Residential Assistance Program and Landscape Water Surveys (former DMMs 1 and 2)

The District's Residential Assistance Program is either instigated at the customer's request or when District staff identifies that usage at a particular meter is excessive or out of the standard range (Table 7-3). Handheld computers help the meter readers determine if a customer's account is using more water than normal based on historical data. The account is then reviewed to confirm the "out of range" usage and the customer is notified by telephone of the higher than normal water usage.

A leak audit is a free service provided to the customer to assist in determining if there is a leak on the property. This includes educating the customer on how to read their water meter and monitor the leak indicator on the meter. Typically these leaks are indoors since most customers do not have landscaping.

TABLE 7-3
LEAK AUDITS

	2005	2006	2007	2008	2009	2010
Leak Audits	117	73	73	35	53	57

The District is filing for a cost-effectiveness exemption to the survey programs (Table 7-4). The Residential Assistance and Landscape Water Survey programs are combined into a single analysis because audits are generally implemented as a single program with indoor and landscape elements. At $940/AF, the program costs exceed the District's avoided cost of water. The analysis was performed using CUWCC assumptions for water savings, decay and program costs and is based on performing 110 surveys per year, 1.5 percent of residential accounts. The assumptions are based on CUWCC estimates from Research and Evaluation Committee Report (8/13/09) which identify a savings per unit of 0.045 AFY and a decay rate of 10 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

TABLE 7-4
COST EFFECTIVENESS OF RESIDENTIAL ASSISTANCE PROGRAM

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$43,306
Total Benefits	$7,944
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$940
Water Savings (AFY)	46
Benefit: Cost	0.2

7.2.2.1.2 High-Efficiency Clothes Washers (former DMM 6)

The District is filing for a cost-effectiveness exemption to the High-Efficiency Clothes Washer (HECW) program (Table 7-5). The analysis is based on offering 63 rebates at $125 each. The assumptions are based on CUWCC estimates from Research and Evaluation Committee Report (8/13/09) which identify a savings per unit of 0.031 AFY and a decay rate of 8 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

TABLE 7-5
COST EFFECTIVENESS OF HIGH-EFFICIENCY CLOTHES WASHERS

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$11,766
Total Benefits	$3,630
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$546
Water Savings (AFY)	22
Benefit: Cost	0.3

7.2.2.1.3 WaterSense Specification (WSS) toilets (former DMM 14)

The District is filing for a cost-effectiveness exemption to the WSS toilet program. Based on a resale rate of 4 percent, the program goal is a replacement of 113 units per year over 10 years. The District is filing for a cost-effectiveness exemption to the WSS toilet program (Table 7-6).

The assumptions are based on a rebate of $100 per unit and CUWCC estimates from Research and Evaluation Committee Report (8/13/09) which identify a savings per unit of 0.024 AFY and a decay rate of 4 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

TABLE 7-6
COST EFFECTIVENESS SUMMARY FOR WSS TOILETS

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$35,323
Total Benefits	$30,306
Benefit/Cost	0.86
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$413
Water Savings (AFY)	86

7.2.2.1.4 Water Sense Specification for new residential development

The District does not have rule making authority, however it works closely with the City to support its requirements for water efficiency in buildings and landscape design. The District will not provide water service unless the city's requirements are met.

The requirement is that the District provide incentives such as rebates, recognition programs, or reduced connection fees, or ordinances requiring residential construction meeting WSS for single and multi-family housing until a local, state or federal regulation is passed requiring water efficient fixtures. The 2010 California Green Building Standards Code (CAL Green Code, CALGreenCode.pdf) addresses these WSS requirements. The CAL Green Code sets mandatory green building measures, including a 20 percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. The Code also identifies voluntary measures that set a higher standard of efficiency. The District is working with the City to identify the CAL Green Code requirements that best meet its needs.

7.2.2.1.5 Commercial, Industrial, and Institutional (CII) DMMs

Approximately ten percent of water deliveries in the District go to commercial, industrial and institutional (CII) customers. Based on 2010 deliveries of 278 AF, the DMM goal for CII reduction is about 3 AFY over ten years. Table 7-7 summarizes the cost analysis for a number of typical CII rebates, none of which are cost-effective for the District. The assumptions are based on CUWCC estimates of savings and decay from the Research and Evaluation Committee Report (8/13/09). Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

TABLE 7-7
COST EFFECTIVENESS OF CII REBATES

Program	Savings/unit	Unit Costs	Benefit: Cost	Cost of saved Water ($/AF)
HE Washer Rebates	0.07	$150	0.72	$232
HET Rebates	0.04	$163	0.54	$298
HE Urinal Rebates	0.07	$450	0.35	$455
ULV Urinal Rebates	0.08	$450	0.40	$392
Zero Consumption Urinal Rebates	0.09	$450	0.46	$344

7.2.2.1.6 Landscape

Less than five percent of the District's use goes to irrigation, about 125 AFY. Residential customers typically have little to no landscaping and there are a small number of customers including motels and the school district that have some landscaping (Table 7-8).

The City has adopted AB 1881, the State Landscape Model Ordinance, by statute and the District supports its enforcement as appropriate. The District will work with the City to identify efficiency opportunities. The assumptions are based on CUWCC estimates of 20 percent savings per audit at a cost of $1,320 and a decay rate of 17 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

TABLE 7-8
COST EFFECTIVENESS OF LANDSCAPE AUDITS

DWR DMM Review Table Cost Effectiveness Summary	
Total Costs	$2,063
Total Benefits	$1,415
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$267
Water Savings (AFY)	8
Benefit: Cost	0.7

7.2.2.1.7 AB 1420 and SBX7-7 Compliance

With its current use at 127 gpcd, District has already met its SBX7-7 goal of 135 gpcd in 2020. The District is implementing all of the Foundational DMMs and is filing exemptions on the Programmatic DMMs.

Managing water demands has always been a priority for the District which has achieved its goals largely by focusing on system performance and replacing its infrastructure; combined with rates increases and a community culture of conservation, the District has significantly reduced its use in recent years and continues to have one of the lowest per capita uses in the region. The District intends to budget $35,000 per year for the implementation of the DMMs described in this section.

Section 8: Water Shortage Contingency Planning

This chapter documents the District's Water Shortage Contingency Plan and Emergency Response Plan (ERP) per requirements of Section 10632 of the Act. The purpose of the Water Shortage Contingency Plan is to provide a plan of action to be followed during the various stages of a water shortage. The plan includes the following elements: action stages, estimate of minimum supply available, actions to be implemented during a catastrophic interruption of water supplies, prohibitions, penalties and consumption reduction methods, revenue impacts of reduced sales, and water use monitoring procedures.

Table 6-6 indicates that the District's supply appears reliable in a multi-year drought through 2035; however, there is still a chance that production capacity may be limited by fire, power outage, earthquake, system failures, or water quality contamination. The District's 2005 UWMP included a recommended Water Shortage Contingency Plan (WSCP) that includes recommended actions to counteract potential water shortage scenarios. The District does not anticipate implementing Stage 2 restrictions in the next 20 years. Actual reductions in water demand from the implementation of the various stages of the WSCP would be determined from a comparison of metered demand from previous years' demand for the same time frame. The Districts Resolution to adopt the Water Shortage Contingency Plan is included in Resolution 11-15 in Appendix B. The District's WSCP is described in the following subsections.

8.1 Water Shortage Restriction Stages

It is recommended for planning purposes that a total water demand reduction goal of 50 percent be established via three stages. Stage 1 would impose a voluntary 15 percent reduction goal, Stage 2 would impose an additional 15 percent mandatory reduction goal, and Stage 3 would impose an additional 20 percent mandatory reduction goal, for an overall reduction in water demand of 50 percent. Each stage would be adopted as needed based on actual supply reductions from the groundwater sources. It would be the responsibility of the District's General Manager to monitor water supply and demand on a daily basis. If evidence of a shortage exists, the General Manager would determine the extent of the severity and recommend the appropriate Stage. The Board of Directors would be notified of the situation and be responsible for the approval of the proposed measures. A public hearing would then occur to discuss the measures with the general public. The specific water management measures and triggering mechanisms for each stage are discussed below.

8.1.1 Stage 1 – 15 Percent Voluntary Reduction

Stage 1 would be adopted when 5 to 15 percent reduction in production capacity occurs or is anticipated to occur. This reduction could be due to fire, earthquake, system failures, contamination, or other event. All restrictions during Stage 1 are voluntary. The following would apply:

- Communicate to the customers through press releases, brochures, mail-outs, and/or water bills the need to voluntarily conserve water and the many ways possible to conserve without affecting their overall lifestyles
- Water customers requested to voluntarily limit the irrigation of landscaped areas

- Water customers requested to voluntary limit “non-essential water use”, which is defined as the following:
  - Use of water to wash any motor vehicle, motorbike, airplane, or other vehicle
  - Use of water to wash down sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas
  - Use of water to wash down buildings or structures for purposes other than immediate fire protection
  - Flushing gutters or permitting water to run or accumulate in any gutter or street
  - Use of water to fill, refill, or add to any outdoor or indoor swimming pools, or Jacuzzi-type pools
  - Use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life
  - Failure to repair a controllable leak within a reasonable period after having been given notice directing the repair of such leak.

Potential fiscal impacts may include additional expenses for water conservation measures may be needed; and a loss of revenue may result from reduced water sales.

8.1.2 Stage 2 – 30 Percent Mandatory Reduction

Stage 2 would be implemented when a 15 to 30 percent reduction in production capacity occurs or is anticipated to occur. All restrictions in this stage are mandatory. All restrictions from the previous Stage would apply unless otherwise stated. The following would apply:

- Continue to mail information regarding the importance of significant water use reductions
- Assess a 30 percent water allocation reduction based on a yearly average for metered services as determined by the District’s water records
- For those users who exceed their allocation, impose a 25 percent water rate increase for the excess volume
- Enforce the non-essential water use discussed in Stage 1 and assess a $25 fee to offenders and install a flow restrictor for repeat offenders of excessive use
- Irrigation shall be by means of hand-held hoses, hand-held buckets, soaker hoses, or drip irrigation only
- Use of hose-end sprinklers or permanently installed automatic sprinkler systems are prohibited at all times
- Prohibit watering landscape between 10 A.M. to 4 P.M.
- Prohibit restaurants from serving water to patrons except upon request of the patron
- Continue to maintain Stage 1 measures

- Appoint a Water Conservation Coordinator, which may be an individual already working for the District with related duties.

Potential fiscal impacts may include utilizing additional revenues received from excessive use and repeat offenders to partially fund conservation program and cover any loss of revenue resulting from reduced water sales. Additionally, an appropriation for overtime resulting from additional workloads due to administration of water conservation measures should be established.

8.1.3 Stage 3 – 50 Percent Mandatory Reduction

Stage 3 would be implemented when a 30 to 50 percent reduction in production capacity occurs or is anticipated to occur. All restrictions in this Stage are Mandatory. All restrictions from the previous Stages would apply unless otherwise stated. The following would apply:

- Implement 50 percent lower water allocations for metered water services
- Charge a $50 “excess user” fee for repeat offenders and install a flow restrictor for repeat offenders of excessive use
- Prohibit watering landscape between 7 A.M. to 7 P.M.
- Perform an evaluation of Stage 2 water conservation measures and implement those not completed
- Continue to maintain Stage 1 and 2 measures
- Report to the District Board as appropriate

Potential fiscal impacts may include utilizing additional revenues received from excessive use and repeat offenders to partially fund conservation program and cover any loss of revenue resulting from reduced water sales and continuing to provide appropriations for overtime resulting from additional workloads due to administration of water conservation measures should be established.

8.2 Minimum Water Supply Available During Next Three Years

The primary factor in limiting the District’s existing water supplies is drought. In evaluating a three year worst-case water supply scenario, the District assumed that severe drought conditions (limited rain and above-average temperatures) would begin immediately and continue for three consecutive years (Table 8-1). Planned water sources for fiscal year 2011-12 reflecting capacity of current facilities will be used as an average/normal water year base for estimating purposes. Also, it was assumed that demand would not be reduced in response to the drought conditions. Available water supplies during the three-year period were projected considering: 1) the current status of each existing source and 2) the past response of each existing source to similar drought conditions.

TABLE 8-1
ESTIMATE OF MINIMUM SUPPLY FOR THE NEXT THREE YEARS

Source	Supply (AF) 2011	2012	2013
Mesquite Springs Basin[a]	3,395	3,055	2,750
Joshua Tree Basin			
Fortynine Palms Subbasin[b]	1,400	1,400	1,400
Eastern Subbasin	790	790	790
Indian Cove Subbasin[b]	1,400	1,400	1,400
Total Supplies	**6,985**	**6,645**	**6,340**

Notes:
(a) Assumes 10 percent reduction in 2012 and again in 2013.
(b) Maximum extraction recommended by DWR to avoid overdraft in this subbasin.

8.3 Actions to Prepare For Catastrophic Interruption

The Act requires documentation of actions to be undertaken by the water supplier to prepare for, and implement during a catastrophic interruption of water supplies. A catastrophic interruption constitutes a proclamation of a water shortage and could be any event (either natural or man-made) that causes a water shortage severe enough to classify as Stage 3 water supply shortage condition.

In order to prepare for catastrophic events, the District has prepared an ERP in accordance with other state and federal regulations. The purpose of this plan is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP includes the District's water system's standardized response and recovery procedures to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin such as an earthquake, fire, biological or chemical contamination, and flood. The ERP takes into account the various aspects of the District's Water System Protection Program pertaining to potential malevolent threats or actual terrorism. The information contained in the ERP is intended to guide staff and inform other emergency responding agencies and includes plans and procedures for the response team. The ERP is included in Appendix G.

Additionally, the District has five (5) emergency generators. A 600 kilowatt (kW) stationary unit will run all aspects of the fluoride removal treatment plant including pumping treated water into the distribution system. A second stationary generator (80 kW) will provide power for the administration and operations and maintenance buildings. A 150 kW and two 230 kW portable units provide for field pumping at well sites and pump stations. The District has an aboveground fuel storage system capable of providing diesel to the generator units for up to 72 hours.

8.4 Prohibitions, Penalties, and Consumption Reduction Methods

At each of the three stages of action within the Water Shortage Contingency Plan, the District and their water customers each have certain actions they must undertake. Public agency actions involve increasing public awareness and education, adopting ordinances prohibiting water waste and establishing mandatory water conservation regulations, and periodically

reviewing triggering levels. Water customer actions involve implementing water conservation measures and complying with water conservation ordinances. Significant measures of the three-stage water shortage plan include:

Stage 1: 0-15 Percent Reduction Goal (Voluntary)

Public Agency Actions

- Monitor conservation levels and increase public awareness.
- Notify customers of shortage conditions and disseminate literature.
- Publish customer use goals.
- Identify Water Shortage Contingency Plan stages and the possible actions per stage.
- Distribute water conservation brochures, information, and conservation kits.
- Conduct exterior and interior water audits upon customer requests.
- Request voluntary water consumption reduction.
- Maintain tiered rate structure to promote water conservation.
- Establish/enforce water waste ordinance.
- Establish/enforce ordinance prohibiting watering from 9 A.M. to 6 P.M.

Water Customer Actions

- Monitor own meter for usage.
- Implement conservation measures to reduce usage.
- Comply with water waste ordinance.
- Comply with prohibited watering during 9 A.M. to 6 P.M.

Stage 2: 30 Percent Reduction Goal (Mandatory)

Public Agency Actions (In addition to actions established in previous Stage)

- Initiate Mandatory Water Conservation Regulations as an Ordinance.
- Establish and enforce mandatory water consumption goals and allocations for all customers.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation guidelines.

Stage 3: 50+ Percent Reduction Goal (Mandatory)

Public Agency Actions (In addition to actions established in previous Stage)

- Initiate Mandatory Water Conservation Regulations as an Ordinance.

- Establish and enforce mandatory water consumption goals and allocations for all customers.
- All water use not required for health and safety is prohibited.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation regulations.
- Prohibition of all outside water use unless necessary for the preservation of health and safety and the public welfare.
- Watering with hand-held five gallon maximum bucket, filled at exterior hose bib or interior faucet (not by hose) shall be allowed at any time. This will assist in preserving vegetable gardens or fruit trees. Outdoor use of bath water, dishwater, and laundry water for irrigation purposes is encouraged to the extent this practice is allowed under local health and safety regulations.
- The filling, refilling or adding of water to swimming and/or wading pools is prohibited.
- The operation of any ornamental fountain or similar structure is prohibited.

References

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Appendix A

DWR Checklist

Table I-1 Urban Water Management Plan checklist, organized by legislation number

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands		Section 2.3
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	System Demands	Retailer and wholesalers have slightly different requirements	Section 1.3.2, Table 1-2
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)	Plan Preparation		Section 1.3.1, Table 1-1
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.	10620(f)	Water Supply Reliability . . .		N/A – No imported water (Section 3.2.1)
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	Plan Preparation		Section 1.2.2, Table 1-2
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).	10621(c)	Plan Preparation		

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
8	Describe the service area of the supplier	10631(a)	System Description		Section 1.3.1 and 1.4
9	(Describe the service area) climate	10631(a)	System Description		Section 1.5
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .	10631(a)	System Description	Provide the most recent population data possible. Use the method described in “Baseline Daily Per Capita Water Use.” See Section M.	Section 1.7 and Section 2
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.1, Table 2-3
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		Section 1.7
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	10631(b)	System Supplies	The ‘existing’ water sources should be for the same year as the “current population” in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 3.3, Table 3-2
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 3.3, Table 3-2

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		Summary of adopted GWMP: Section 3.3 and Appendix C
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		Sections 3.3.1 – 3.4.3
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies		Basins are non-adjudicated
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies		N/A, Pumping capacity: Section 3.3.4
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.	10631(b)(2)	System Supplies		Section 3.4.4, Section 3.5.1
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	System Supplies		Section 3.6, Table 3-4
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(4)	System Supplies	Provide projections for 2015, 2020, 2025, and 2030.	Section 3.6, Table 3-5

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability . . .		Section 6, Tables 6-2 to 6-6
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	Water Supply Reliability . . .		Section 6.3.4 – "..has adequate supplies to meet demands during normal, single-dry, multiple-dry years throughout the 25-year planning period."
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		Section 3.7
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural.	10631(e)(1)	System Demands	Consider "past" to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 2.2, Table 2-2

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra-low-flush toilet replacement programs.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 7
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.	10631(f)(3)	DMMs		Cost Effectiveness tables throughout Section 7
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.	10631(f)(4)	DMMs		Section 7.1

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	10631(g)	DMMs	See 10631(g) for additional wording.	Section 7
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.	10631(h)	System Supplies		Section 3.3.4
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies		Section 3.9

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	N/A – Not a signatory to the MOU
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	System Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	N/A – do not rely on wholesaler
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands		Section 2.2, Table 2-2
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.	10632(a)	Water Supply Reliability . . .		Section 8.2
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Water Supply Reliability . . .		Section 8.3
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)	Water Supply Reliability . . .		Section 8.4

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	Water Supply Reliability . . .		Section 8.5
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)	Water Supply Reliability . . .		Section 8.5
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .		Section 8.5
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)	Water Supply Reliability . . .		Section 8.6
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .		Section 8 and Appendix B)
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .		Section 8 (2nd paragraph)
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	10633	System Supplies		Section 4
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	System Supplies		Section 4 – no municipal sewer system or WWTP
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies		N/A

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies		N/A – "at this time there are no opportunities for water recycling or programs that deal with recycled water" (Section 4.1)
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	System Supplies		Section 4.1.1
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies		Section 4.1.1: "Recycled water would not be considered until 2040"
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	System Supplies		N/A – The District does not have access to recycled water sources at this time.
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	System Supplies		N/A – The District does not have access to recycled water sources at this time.
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	10634	Water Supply Reliability . . .	For years 2010, 2015, 2020, 2025, and 2030	Section 5, Table 5-1

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)	Water Supply Reliability . . .		Tables 6-4 to 6-6
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.	10635(b)	Plan Preparation		
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642	Plan Preparation		Section 1.2.2
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.	10642	Plan Preparation		Section 1.2.2, Table 1-2
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		Section 1.2.2, Table 1-2
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation		

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation		
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.	10645	Plan Preparation		

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

Appendix B

Public Outreach Materials

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of San Bernardino

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the:

DESERT TRAIL

a newspaper of general circulation, printed and published WEEKLY in the City of TWENTYNINE PALMS County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California,

under the date of 11/17 19 38

Case Number 43099; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

6/9, 6/16

all in the year 2011.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at : TWENTYNINE PALMS

California, this **16th.** day of **June,2011**

Bekie Edelbrock

Signature
Bekie Edelbrock

This space is for the County Clerk's Filing Stamp

Proof of Publication

NOTICE OF A PUBLIC HEARING REGARDING ADOPTION OF AN URBAN WATER MANAGEMENT PLAN

NOTICE OF A PUBLIC HEARING
REGARDING ADOPTION OF AN
URBAN WATER MANAGEMENT PLAN
TWENTYNINE PALMS WATER DISTRICT

The Board of Directors of the Twentynine Palms Water District will conduct a public hearing at 6:00 PM on June 22, 2011 at the District Offices, 72401 Hatch Road, Twentynine Palms, to receive comments and concerns regarding adoption of an Urban Water Management Plan. A copy of the plan is available for review at the District Offices or on our website at www.29palmswater.org, prior to the Public Hearing.

If you have any questions concerning the hearing, please contact Paula Rogers at (760) 367-1792 ext. 308 during normal business hours.

(PUB: T. 6/9, 6/16/2011)

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277-2935
Phone 760-367-7546 Fax 760-367-6612

April 13, 2011

City of Twentynine Palms
Planning Division
6336 Adobe Road
Twentynine Palms, California 92277

Attn: Mr. Charles LaClaire

Re: Notification of Public Hearing for 2010 Twentynine Palms Water District Urban Water Management Plan

Dear Mr. LaClaire:

The Twentynine Palms Water District ("TPWD") is preparing an Urban Water Management Plan ("UWMP") as they did in 2003 and 2005. Adoption of the 2010 UWMP is required under the Urban Water Management Planning Act (Act) by July 1, 2011.

TPWD is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

A Public Hearing will be held on Wednesday, June 22, 2011 at 6:00 p.m.in the District Board Room located at 72401 Hatch Road, Twentynine Palms, California 92277, to consider adoption of the 2010 Urban Water Management Plan.

If you have any questions, please contact me at (760) 367-7546.

Sincerely,

Mike Wright
General Manager

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277-2935
Phone 760-367-7546 Fax 760-367-6612

April 13, 2011

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Avenue
San Bernardino, CA 92415

Attn: Ms. Judy Tatman

Re: Notification of Public Hearing for 2010 Twentynine Palms Water District Urban Water Management Plan

Dear Ms. Tatman:

The Twentynine Palms Water District ("TPWD") is preparing an Urban Water Management Plan ("UWMP") as they did in 2003 and 2005. Adoption of the 2010 UWMP is required under the Urban Water Management Planning Act (Act) by July 1, 2011.

TPWD is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

A Public Hearing will be held on Wednesday, June 22, 2011 at 6:00 p.m.in the District Board Room located at 72401 Hatch Road, Twentynine Palms, California 92277, to consider adoption of the 2010 Urban Water Management Plan.

If you have any questions, please contact me at (760) 367-7546.

Sincerely,

Mike Wright
General Manager

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277-2935
Phone 760-367-7546 Fax 760-367-6612

April 13, 2011

Joshua Tree National Park
Attn: Park Planning
74485 National Park Drive
Twentynine Palms, California 92277

Re: Notification of Public Hearing for 2010 Twentynine Palms Water District Urban Water Management Plan

To whom it may concern:

The Twentynine Palms Water District ("TPWD") is preparing an Urban Water Management Plan ("UWMP") as they did in 2003 and 2005. Adoption of the 2010 UWMP is required under the Urban Water Management Planning Act (Act) by July 1, 2011.

TPWD is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Upon your request, a copy of the draft UWMP can be sent to you, when it is made available.

A Public Hearing will be held on Wednesday, June 22, 2011 at 6:00 p.m.in the District Board Room located at 72401 Hatch Road, Twentynine Palms, California 92277, to consider adoption of the 2010 Urban Water Management Plan.

If you have any questions, please contact me at (760) 367-7546.

Sincerely,

Mike Wright
General Manager

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277-2935
Phone 760-367-7546 Fax 760-367-6612

April 13, 2011

Mr. Joe Guzzetta
General Manager
Joshua Basin Water District
61750 Chollita Road
Joshua Tree, California 92252

Re: Notification of Public Hearing for 2010 Twentynine Palms Water District Urban Water Management Plan

Dear Joe:

The Twentynine Palms Water District ("TPWD") is preparing an Urban Water Management Plan ("UWMP") as they did in 2003 and 2005. Adoption of the 2010 UWMP is required under the Urban Water Management Planning Act (Act) by July 1, 2011.

TPWD is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Upon your request, a copy of the draft UWMP can be sent to you, when it is made available.

A Public Hearing will be held on Wednesday, June 22, 2011 at 6:00 p.m.in the District Board Room located at 72401 Hatch Road, Twentynine Palms, California 92277, to consider adoption of the 2010 Urban Water Management Plan.

If you have any questions, please contact me at (760) 367-7546.

Sincerely,

Mike Wright
General Manager

Appendix C

2008 Groundwater Management Plan (on CD)

Appendix D

Resolution No. 10-03

RESOLUTION 10-03

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT PROCLAIMING THE MONTH OF MAY 2010 AS WATER AWARENESS MONTH

WHEREAS, water is a basic and essential need of every living creature; and

WHEREAS, the Twentynine Palms Water District is working to increase awareness about the importance of water conservation; and

WHEREAS, Water Awareness Month is a statewide campaign to increase public understanding of water issues and to make water conservation a way of life; and

WHEREAS, every business, industry, school and citizen can help by saving water and thus promote a healthy economy and community; and

WHEREAS, all residents and businesses are encouraged to help protect this precious resource by practicing water saving measures and becoming more aware of the need to save water.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Twentynine Palms Water District does hereby proclaim the month of May 2010 as Water Awareness Month in the community of Twentynine Palms to help increase public awareness of water issues and conservation.

PASSED, APPROVED AND ADOPTED on April 28, 2010 by the following vote:

Ayes: Directors Chambers, Cisneros, Gallagher, Moore and Shinaver
Noes: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

Appendix E

Resolution No. 11-02

RESOLUTION 11-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT CONCURRING WITH A MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND CALIFORNIA GREEN BUILDING STANDARDS

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the District is subject to the requirements of the Urban Water Management Planning Act which requires the District to prepare an Urban Water Management Plan and required updates, amendments and revisions in order to plan for the conservation and efficient use of water; and

WHEREAS, as of the date of this Resolution, the District is in the process of engaging in the review, amendment, revision and updating of its Urban Water Management Plan. In connection with said update, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to that certain Model Water Efficient Landscape Ordinance ("Landscape Ordinance") which became the effective Landscape Ordinance for water efficiency within Twentynine Palms by way of action documented by the City of Twentynine Palms on or about February 2, 2010. For example, and not by way of limitation, the California Department of Water Resources ("DWR") has released its Draft Guidebook for 2010 Urban Water Management Plans which includes a suggestion that a Landscape Ordinance may assist a public agency in complying with the Water Demand Management Measure requirements of the Act, which also ties into an agency's eligibility for loan and grant funding opportunities; and

WHEREAS, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to those certain California Green Building Standards as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010. For example, and not by way of limitation, DWR's Draft Guidebook provides that the California Green Building Code update ("Cal Green") reinforces and in some cases exceeds the goal of water use efficiency in urban landscapes.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the Landscape Ordinance which became the effective Landscape Ordinance for water efficiency within the City of Twentynine Palms, effective January 1, 2010.

Section 3: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the California Green Building Standards Code, 2010 Edition, published by the California Building Standards Commission, as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010.

Section 4: If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 5: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 23rd day of February 2011 by the following roll call vote:

Ayes:	Directors Bourikas, Chambers, Cisneros and Moore
Noes:	None
Abstain:	None
Absent:	Director Shinaver

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

Appendix F

AWWA M36 Water Loss Analysis

AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.2

Back to Instructions

? Click to access definition

Water Audit Report for: Twentynine Palms Water District
Reporting Year: 2009/10 (7/2009 - 6/2010)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	9	3,035.000	acre-ft/yr	
Master meter error adjustment (enter positive value):	9	45.500	under-registered	acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr	
Water exported:	n/a	0.000	acre-ft/yr	
WATER SUPPLIED:		3,080.500	acre-ft/yr	

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:
Billed metered:	9	2,832.000	acre-ft/yr		
Billed unmetered:	n/a	0.000	acre-ft/yr		
Unbilled metered:	9	9.500	acre-ft/yr		
Unbilled unmetered:		38.506	acre-ft/yr	1.25%	

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION:		2,880.006	acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

200.494 acre-ft/yr

Apparent Losses

				Pcnt:	Value:
Unauthorized consumption:		7.701	acre-ft/yr	0.25%	

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	n/a	0.000	acre-ft/yr		
Systematic data handling errors:	10	1.000	acre-ft/yr		
Apparent Losses:		8.701			

Enter a percentage less than 10% in the red cell (J42), or select 'Value' option

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	191.793	acre-ft/yr
WATER LOSSES:	200.494	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:	248.500	acre-ft/yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	265.0	miles	
Number of active AND inactive service connections:	10	7,958		
Connection density:		30	conn./mile main	
Average length of customer service line:	10	0.0	ft	(pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	9	85.0	psi	

COST DATA

Total annual cost of operating water system:	10	$4,265,684	$/Year
Customer retail unit cost (applied to Apparent Losses):	10	$1.86	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9	$208.77	$/acre-ft

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	8.1%
Non-revenue water as percent by cost of operating system:	1.3%
Annual cost of Apparent Losses:	$7,050
Annual cost of Real Losses:	$40,041

Operational Efficiency Indicators

Apparent Losses per service connection per day:	0.98	gallons/connection/day
Real Losses per service connection per day*:	N/A	gallons/connection/day
Real Losses per length of main per day*:	646.12	gallons/mile/day
Real Losses per service connection per day per psi pressure:		gallons/connection/day/psi
? Unavoidable Annual Real Losses (UARL):	250.16	acre-feet/year
From Above, Real Losses = Current Annual Real Losses (CARL):	191.79	acre-feet/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.77	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 90 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Unauthorized consumption
3: Master meter error adjustment

For more information, click here to see the Grading Matrix worksheet

Appendix G

Emergency Response Plan

EMERGENCY RESPONSE PLAN (ERP)
Water System

TWENTYNINE PALMS WATER DISTRICT
72401 Hatch Road
Twentynine Palms, CA 92277
(760) 367-7546

TABLE OF CONTENTS

I. INTRODUCTION

A. DEFINITION

An Emergency Response Plan (ERP) is an organized way of responding to an event(s) or set of circumstances that goes beyond those normally found or associated with Twentynine Palms Water District in its normal day-to-day functioning in water delivery and services. The responses outlined in this document are designed to assist in taking action for those instances or circumstances that are NOT normally encountered or are NOT reasonably expected to occur in the normal course of business. This type of an event(s) or set of circumstances may occur with little or no warning and may or may not involve criminal activity.

B. PURPOSE

The purpose of this plan is to outline responsibilities, actions, precautions and policies for specific employees to provide a framework for maintaining operations and on-going or resumption of service to the community.

C. GOAL

The goal of Twentynine Palms Water District is to have an effective and efficient response to these unrelated operation circumstances, which could interfere with the normal service to customers and to minimize their impact.

II. RESPONSE TEAM ORGANIZATION

A. GENERAL ACTION TO BE TAKEN

1. Initial Assessment and Notification

   The notification matrix chart must be activated for the type of emergency situation occurring. Activation of the Emergency Operations Center (EOC) must occur immediately in order to direct and control operations. Communications through the EOC are essential so as to provide the proper coordination of response efforts.

2. Damage Assessment

   An immediate assessment of damages is essential to ascertain the extent of the situation and the initiating factor (security or non-security related). Some immediate factors to consider are:

   a. What and how much of the system is affected?
   b. Can it be isolated and how?
   c. Is this a security related event?
   d. What type of assistance do we need?

3. Work Assignments

   As soon as field reports are received, develop a plan of action and make certain everyone understands their work assignment.

4. Coordination With Other Agencies/Contractors

   If assistance is required and authorized, activate the appropriate mutual aid assistance program or request the assistance of private contractors as authorized.

5. Public Information

   The general public must be given prompt and factual information as appropriate:

   a. Nature of problem.
   b. Actions currently being taken and planned for immediate future.
   c. Estimated time of restoration of service.
   d. Determination of type of action required to inform the public.

B. EMERGENCY OPERATIONS CENTER

The Primary EOC is located in the Board Room of the Administration Office at 72401 Hatch Road, Twentynine Palms, CA. This office is equipped with unlisted telephone lines, updated records, and CAD drawings of all facilities. This site is readily accessible to all portions of distribution systems. It is the primary nerve center for controlling our supply, treatment, pumps and storage facilities.

The Secondary EOC is the storage building at the rear of the Administration Office. This location also has ready access to our supply source, and our distribution system. Activation of the EOC can occur by management or anyone in the field or office who discovers a situation that warrants it.

C. MANAGEMENT REPORTING STATIONS

General Manager	Emergency Operations Center
Operations Manager	Emergency Operations Center
Operations Superintendent	Emergency Operations Center
Financial Management	Emergency Operations Center
Service Worker III	Emergency Operations Center
Office Manager	Emergency Operations Center
District Secretary	Emergency Operations Center
Customer Service Rep	Emergency Operations Center
All Other Service Workers	Emergency Operations Center

Water Treatment Plant Operator	Incident location OR Priority One - Route ONE
Water Treatment Plant Operator	Incident location OR Priority One - Route TWO
Water Treatment Plant Operator	Incident location OR Priority One - Route THREE

D. EMERGENCY REPORTING STATIONS

Due to the probability or the inability of many employees to reach assigned emergency stations promptly, available management and office personnel will be assigned as necessary. Following preliminary damage assessment, employees may be reassigned as priorities and employee work experience dictate.

The type of emergency and whether it is directed at one location or multiple locations determines the deployment of personnel.

1. Treatment Plant Employees will need to remain at this critical site to monitor storage tanks in order to maintain adequate treatment and proper pump levels to the system. They may also be assigned to the Incident Location or Priority Routes One, Two or Three.

2. Service Workers have been designated as couriers and will, therefore, provide the means of communication at the direction of the Incident Commander.

3. Field Operators and Maintenance Employees will be assigned to monitor well stations, storage tanks and pump stations under the direction of the Incident Commander. Assigned servicemen will relate any abnormal conditions directly to the command center and to the plant as directed.

E. DUTIES OF MANAGEMENT PERSONNEL

1. GENERAL MANAGER shall serve as liaison between City, County and State officials. Assessment of priorities will be designated by the General Manager to personnel concerned. Progress reports and assignments will be promptly forwarded to the Manager to insure that he/she is fully informed at all times. News releases will be made by the Manager. All personnel are cautioned against making statements concerning District operations unless they are authorized, during or after emergencies.

2. OPERATIONS MANAGER will be designated as the INCIDENT COMMANDER and shall assist the General Manager in implementing the plan of action to be taken. The Chief Plant Operator shall dispatch department personnel to monitor treatment facilities, wells, reservoirs, booster stations and storage tanks. In case of loss of both telephone and radio communications, Service Workers will assume the duties of couriers. If the emergency is of local origin, the Incident Commander will contact other area water systems (see Notification Call List) to secure additional personnel, materials or equipment as required.

3. OPERATIONS SUPERINTENDENT shall fulfill duties requested by the Manager. The individual will normally be stationed at the treatment plant and will serve as liaison between the plant and EOC. The individual will assume complete charge of water operations. Plant personnel shall monitor the water quality and conduct bacteriological testing to determine quality and potability of water in affected areas of the distribution systems.

The Operations Superintendent is in charge of water treatment and pumping facilities. He/She will be stationed at the Treatment Plant and will direct the work of plant operators as required. In the event of limited work force, he/she will fill in whenever and wherever required.

4. WATER TREATMENT PLANT OPERATORS I-II will normally be stationed at the treatment plant. In case the Chief Plant Operator is not available, the Water Treatment Plant Operator II will be assigned to this position at the Treatment Plant and assume all responsibility of the production operations. The other Plant Operators, at the direction of the Manager, shall assign personnel and equipment to the disaster area and/or cause the Priority One, Priority Two, and Priority Three Sites and Routes (SEE APPENDIX A) to be reviewed. Maintenance personnel shall be trained in determining the location of water mains, valves and pump stations from maps and CAD drawings, which are located at the Administration and/or Operations Building and in the cab of each maintenance vehicle, in order to effectively isolate problem areas in the distribution grid.

The Engineering Department shall revise distribution maps periodically and distribute the revisions to all distribution authorized personnel.

5. DESIGNATED DISTRIBUTION WORKERS shall have the primary responsibility of overseeing field operations other than the Treatment Plant under the direction of the Incident Commander.

6. OFFICE MANAGER shall be primarily responsible for all communications at the Command Post. The Office Manager will dispatch personnel as necessary to insure a complete line of communication at all times. This person will maintain a record log of all activities, radio and phone communications.

NOTE: All of the above listed management team shall maintain an up-to-date list of all Twentynine Palms Water District personnel, their residence address and phone numbers. Managers shall be responsible for contacting the personnel in his/her section during an after hours emergency.

When any of the above are absent due to sickness or vacation, another member of the management staff will be assigned as required. The management staff is required to list an address and/or phone number (where they can be contacted while absent from our service area).

F. EMERGENCY FUNDS

There is no amount specifically budgeted for major contingency expenditures. However, the Manager is authorized to order immediate emergency expenditures to insure restoration of water service to the general public. If major expenditures are anticipated, the Manager is directed to notify the President of the Board of Directors and proceed with their advice and consent. Should the President be unavailable, the next ranking officer shall be contacted.

G. IDENTIFICATION CARDS

All personnel have been issued an identification card, which is to be carried at all times. In the event of an emergency this will assist in your identification and access to water areas temporarily closed to the general public.

H. DISTRIBUTION SYSTEM MAPS AND VALVE LOCATION RECORDS

Copies of distribution system maps are distributed as follows: All Maintenance Vehicles; EOC Command Post; Water Treatment Plant.

III. NOTIFICATION and ALERT PROCESS

A. NOTIFICATION

a. If discovery of an issue or event is made by a Twentynine Palms Water District employee while performing their regular duties, they shall immediately report this by the fastest means possible to a "Central Point of Contact". The report will include their name, type of occurrence, where they are and other appropriate information.

Secondly, depending on the occurrence and possible life threatening conditions to themselves or any others, make a mutual determination with the person at "Central Point of Contact" as to their next course of action. SEE NOTIFICATION CALL LIST. Some examples of next course(s) of action could include:

1. Dispatching a Twentynine Palms Water District employee to evaluate the situation further or make contact with individual(s) at the scene. If security issues are suspected or involved, special care must be exercised so as not to "disrupt" what may be a "crime scene".
2. Continue to monitor and further check on individual and/or the developing situation. This shall occupy the full attention of the "Central Point of Contact" during this time period.
3. Central Point of Contact shall direct Twentynine Palms Water District employees reporting, to remain at the scene and continue to monitor the situation.
4. Notify Business Unit Manager of affected area.
5. Notify the Managerial person in charge at Twentynine Palms Water District.
6. Notify local law enforcement via 911 call.
7. Activate the Emergency Action Plan (EAP) for related occurrence.
8. Initiate notifications in accordance with EAP.

b. If discovery comes from a Non-Twentynine Palms Water District employee, it shall be immediately relayed by the fastest means possible to the "Central Point of Contact". The report will include the source of the notification (Name, Organization, Phone Number) and type of occurrence and any other information stated.

Secondly, depending on the occurrence and possible life threatening conditions, the person at "Central Point of Contact" will make a determination as to the next course of action that may need to be taken. SEE NOTIFICATION CALL LIST. Some examples of next course(s) of action could include:

1. Dispatching a Twentynine Palms Water District employee to evaluate the situation further or make contact with individual(s) at the scene. If security issues are suspected or involved, special care must be exercised so as not to "disrupt" what may be a "crime scene".
2. Continue to monitor and check on individual and situation. This shall occupy the full attention of the "Central Point of Contact" during this time period.
3. Notify Business Unit Manager of affected area.
4. Notifying the Managerial person in charge at Twentynine Palms Water District.
5. Notify local law enforcement via a 911 call.

6. Activate the Emergency Action Plan for related occurrence.
7. Initiate notifications in accordance with EAP.

c. Activation of the Emergency Action Plan (EAP) for the various issues or occurrences needs to happen in a timely and efficient manner. The protocol to physically make this happen shall take advantage of modern communications and electronics as this can be an extremely involved and timely task.

d. A point to be aware of and remember is that the "news media" monitors radio frequencies utilized by the law enforcement community and may arrive at the scene before any EAP is up and running. Therefore, preparations for "Public Disclosure and Twentynine Palms Action Plan" need to be ready with a spokesperson simultaneously with any public notification.

NOTE: This is where prior planning and preparation will assist in making this "Twentynine Palms Emergency" one that can be managed with the care and sensitivity it needs. Directions to all Twentynine Palms Water District employees shall be reaffirmed as to "who" will speak for Twentynine Palms Water District and to whom the "news media" will be directed.

B. COMMUNICATIONS FAILURE

If a natural or man-made disaster immediately disrupts all forms of automatic communications, management and employees should report to their "assigned emergency station" as quickly as possible. If their primary assigned station is inaccessible, employees should immediately report to the EOC.

IV. GENERAL SECURITY POLICY PROTOCOLS

A. STATUS

The response to a security event requires due care. In addition to the threat, damage or possible damage present, the event may be considered a criminal act and the area, a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered or may be designated a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude water personnel from entering unless they are specifically authorized to by the police.

B. EPA ALERT LEVELS

CONDITION	CONSIDER ADOPTING THESE MEASURES	
LOW (GREEN) Low Risk of Terrorist Attack Signifies a low risk of terrorist attacks. Protective measures should focus on ongoing facility assessments; and the development, testing, and implementation of emergency plans. In addition to THREAT LEVEL GREEN, there are four higher threat levels: blue, yellow, orange, and red. (Please refer to the other fact sheets for information on suggested steps to be taken during other threat condition levels.)	**Detection**	• Monitor water quality at the source water, leaving the plant, and in distribution and storage systems. Establish baseline results. Review operational and analytical data to detect unusual variations. • Follow-up on customer complaints concerning water quality and/or suspicious behavior on the facilities. • Confirm communication protocol with public health officials concerning potential waterborne illnesses.
	Preparedness	• Post emergency evacuation plans in accessible, but secure, location near entrance for immediate access by law enforcement, fire response, and other first responders. • Inventory spare parts and on-hand chemicals. Check if sufficient. • Identify sensitive populations within the service area (e.g., hospitals, nursing homes, daycare centers, schools, etc.) for notification, as appropriate, in the event of a specific threat against the utility. • Back-up critical files such as plans and drawings, as-builts, sampling results, billing, and other critical information. • Conduct appropriate background investigations of staff, contractors, operators, and others with access to the facility. • Prepare vulnerability assessments and revise to incorporate changes made (e.g., assets added/replaced or new countermeasures implemented). • Ensure that employees understand appropriate emergency notification procedures.
	Prevention	• Train staff in safety procedures, such as handling hazardous materials and maintaining and using self-contained breathing apparatus. • Secure equipment such as vehicles and spare parts. • Monitor requests for potentially sensitive information.
	Protection	• Check all chemical deliveries for driver identification and verification of load. • Maintain vigilance and be alert to suspicious activity. Inspect buildings in regular use for suspicious packages and evidence of unauthorized entry. Report any suspicious activity to appropriate authorities. • Prosecute intruders, trespassers, and those detained for tampering to the fullest possible under applicable laws. • Review requests for tours and identify protocols for managing the tour. • Implement controls for construction activities at critical sites. • Maintain disinfectant residuals as required by regulations. • Implement best management practices for optimizing drinking water treatment.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
GUARDED (BLUE) General Risk of Terrorist Attack Signifies a guarded risk of terrorist attacks. Protective measurers should focus on activating employee and public information plans; exercising communication channels with response teams and local agencies; and reviewing and exercising emergency plans.	**Detection**	• Test security alarms and systems for reliability.
	Preparedness	• Reaffirm communication and coordination protocols (embedded in the utility's emergency response plan) with local authorities such as police and fire departments, HAZMAT teams, hospitals, and other first responders. • Prepare and/or revise emergency response plans associated communication protocols. Include appropriate local officials concerned with law enforcement, emergency response and public health. • On a regular basis post employee reminders about events that constitute security violations and ensure employees understand notification protocol in the event of a security breach. • Prepare draft releases, public notices and other communications for a variety of incidents. Route through appropriate channels of review to ensure pieces are clear and consistent.
	Prevention	• Secure buildings, rooms, and storage areas not in regular use. Maintain a list of secured areas or facilities and monitor activity in these areas.
	Protection	• Control access to mission critical facilities.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
ELEVATED (YELLOW) Significant Risk of Terrorist Attack Signifies an elevated risk of terrorist attacks. Protective measures should focus on increasing surveillance of critical facilities; coordinating response plans with allied utilities and response teams and local agencies; and implementing emergency plans, as appropriate.	**Detection**	• To the extent possible, increase the frequency and extent of monitoring activities and review results against baseline. • Increase review of operational and analytical data (including customer complaints) with an eye toward detecting unusual variability (as an indicator of unexpected changes in the product). Variations due to natural or routine operational variability should be considered first. • Increase surveillance activities in source and finished water areas.
	Preparedness	• Review and update emergency response procedures and communication protocols. • Establish unannounced security spot checks (e.g., verification of personal identification and door security) at access control points for critical facilities. • Increase frequency for posting employee reminders of the threat situation and about events that constitute security violations. • Ensure employees understand notification protocol in the event of a security breach. • Conduct security audit of physical security assets, such as fencing and lights, and repair or replace missing/broken assets. Remove debris from along fence-lines that could be stacked to facilitate scaling. • Maximize physical control of all equipment and vehicles inoperable when not in-use (e.g., lock steering wheels, secure keys, chain and padlock on front-end loaders, etc.). • Review draft communications on potential incidents, brief media relations personnel of potential for press contact and/or issuance of release. • Review and update list of sensitive populations within the service area, such as hospitals, nursing homes, daycare centers, schools, etc., for notification, as appropriate, in the event of a specific threat against the utility. • Contact neighboring water utilities to review coordinated response plans and mutual aid during emergencies. • Review whether critical replacement parts are available and accessible.
	Prevention	• Carefully review all facility tour requests before approving. If allowed, implement security measures to include list of names prior to tour, request identification of each attendee prior to tour, prohibit backpacks/duffle bags, cameras and identify parking restrictions. • On a daily basis, inspect the interior and exterior of buildings in regular use for suspicious activity or packages, signs of tampering, or indications of unauthorized entry. • Implement mailroom security procedures. Follow guidance provided by the United States Postal Service.
	Protection	• Verify the identity of all personnel entering the water utility. Mandate visible use of identification badges. Randomly check identification badges and cards of those on the premises. • At the discretion of the facility manager or security director, remove all vehicles and objects (e.g., trash containers) located near mission critical facility security perimeters and other sensitive areas. • Verify the security of critical information systems (e.g., Supervisory Control and Data Acquisition (SCADA), Internet, email, etc.) and review safe computer and internet access procedures with employees to prevent cyber intrusion. • Consider steps needed to control access to all areas under the jurisdiction of the water utility.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
HIGH (ORANGE) High Risk of Terrorist Attack Signifies a high risk of terrorist attacks. Protective measures should focus on limiting facility access to essential staff and contractors, and security efforts with local law enforcement offices and the armed forces, as appropriate.	**Detection**	• Increase the frequency and extent of monitoring activities. Review results against baseline. • Confirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses. • If a neighborhood watch-type program is in place, notify the community and request increased awareness.
	Preparedness	• Confirm emergency response and laboratory analytical support network are ready for deployment 24 hours per day, 7 days a week. • Reaffirm liaison with local police, intelligence, and security agencies to determine likelihood of an attack on the water utility personnel and facility and consider appropriate protective measures (e.g., road closing, extra surveillance, etc.). • Practice communications protocol with local authorities and others cited in the facility's emergency response plan. • Post frequent reminders for staff and contractors of the threat level, along with a reminder of what events constitute security violations. • Ensure employees are fully aware of emergency response communication protocols and have access to contact information for relevant law enforcement, public health, environmental protection, and emergency response organizations. • Inspect and practice activation of available emergency interconnections with neighboring water agencies. • Have alternative water supply plan ready to implement (e.g., bottled water delivery).
	Prevention	• Discontinue tours and prohibit public access to all operational facilities. • Consider requesting increased law enforcement surveillance, particularly of critical assets and otherwise unprotected areas.
	Protection	• Evaluate need to staff water treatment/production facility at all times. • Consider the need to prohibit recreational use of surface water reservoirs. • Increase security patrol activity to the maximum level sustainable and ensure tight security in the vicinity of mission critical facilities. Vary the timing of security patrols. • Request employees change password on critical information management systems.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
SEVERE (RED) Severe Risk of Terrorist Attack Signifies a severe risk of terrorist attacks. Protective measures should focus on the decision to close specific facilities and the redirection of staff resources to critical operations.	**Detection**	• Ensure that list of sensitive of populations (e.g., hospitals, nursing homes, daycare centers, schools, etc.) within the service area is accurate and shared with appropriate public health officials. • Reconfirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses.
	Preparedness	• Post daily notices to staff regarding threat level and appropriate security practices. • Where appropriate, place back-up operational capacity on-line (water treatment plant filters, turbines, etc.). • Ensure key utility personnel are on duty. • Where appropriate, provide public notification for citizens to store emergency water supply or to implement other preparatory measures. • Evaluate the need for opening an emergency operations center.
	Prevention	• As appropriate, request increased law enforcement and/or security agency surveillance, particularly of critical assets and otherwise unprotected areas (e.g., consider if National Guard assistance is needed and make appropriate request). • Limit access to facilities and activities to essential personnel. • Consider whether mail and packages should go to a central, secure location and be inspected before distribution. Remind mailroom personnel of the need for heightened awareness when sorting and distributing all incoming mail.
	Protection	• Ensure existing security policies, procedures, and equipment are effectively implemented. • Recheck security of all on-site chemical storage and utilization areas. • Implement frequent and staggered inspections of the exterior of buildings (to include roof areas) and parking areas. • Re-check the security of critical information systems (e.g., SCADA, Internet, email, etc.) and have staff change computer passwords. • Consider placing staff at remote (typically unmanned) facilities.

V. TYPES of EMERGENCIES (Non-security & Security Related)

A. MEDICAL EMERGENCIES (Non-security related)

1. GENERAL

Medical emergencies can occur at any time. The medical emergency may be for one person or groups of individuals and may directly or indirectly affect the water system property or the water system (at any point within the system). Most medical emergencies can be handled with first aid procedures but others, depending on the seriousness, may require immediate attention by medically trained professionals.

Time and proper response is of the essence in addressing emergency medical situations.

The stockpiling of emergency first aid kits and supplies should be considered at all locations or nearby sites. Automatic External Defibrillators (AED) should be considered at all main locations. All individuals should be trained in First Aid, CPR and the use of AED.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of medical situation, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Evaluate and apply basic first aid as appropriate.

b. If emergency is beyond first aid treatment, call for assistance by notifying Twentynine Palms Water District Supervisor OR calling 911 immediately, depending on the emergency.

c. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

d. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to an individual - Conduct an immediate review of the medical emergency situation. If it appears that it is a minor emergency that can be attended to by you with very basic first aid, do so. If it appears beyond your capability, call for assistance (911), and notify your supervisor.

b. If there are multiple injuries IMMEDIATELY call for assistance (911), and notify your supervisor. Apply basic first aid and keep individuals safe from additional hazards while waiting for emergency services.

c. Take action to alert others to dangers that may be present and to stay and assist or stay clear.

d. Based on activities individual(s) was performing, evaluate impact on current water system operations.

e. Coordinate activities to maintain water system stability as needed.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the medical emergency. If necessary, a damage assessment of the process, facility or activity should occur. Necessary actions need to be identified and communicated.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

B. VEHICLE ACCIDENTS (Non-security related)

1. GENERAL

Vehicle accidents can occur at any time. A vehicle accident may involve a single vehicle or multiple vehicles. In addition to the physical damage caused by the vehicle(s) other issues may be involved which can include medical situations and/or fire. Vehicle(s) damaged may be specialized equipment utilized in the maintenance of the water system and may directly or indirectly affect the water system property or the water system (at any point within the system).

Time and proper response is of the essence in addressing this emergency.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of accident, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Evaluate and apply basic first aid as appropriate.

b. If emergency is beyond first aid treatment, call for assistance by notifying Twentynine Palms Water District Supervisor OR calling 911 immediately depending on the emergency.

c. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

d. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Conduct an immediate review of the situation to see if a medical emergency situation exists. If it appears that it is a minor emergency that can be attended to with very basic first aid, do so. If it appears beyond your capability, call for assistance (911), and notify your supervisor.

b. If there are multiple injuries IMMEDIATELY call for assistance (911), and notify your supervisor. Apply basic first aid and keep individuals safe from additional hazards while waiting for emergency services.

c. Take action to alert others to dangers that may be present and to stay and assist or stay clear.

d. Photograph and document the accident. Have the driver and any occupants make a statement as to what occurred. If the accident occurred off the Twentynine Palms Water District property, call the local police to take an accident report.

e. Based on activity or damage done by the vehicle(s); evaluate impact on current water system operations.

f. Coordinate activities to maintain water system stability as needed.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the medical emergency. If necessary, a damage assessment of the process, facility or activity should occur. Necessary actions need to be identified and communicated.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

C. FLOODS (Non-security related)

1. GENERAL

Flood events are normally based on weather conditions that create an over-abundance of water for the land or storm system to handle maybe affecting the water system property or the water system (at any point within the system). Not all of this area is prone to this type of weather; however, flooding of low lands can result in severe injury or damage to individuals, property, structures and delivery systems.

The stockpiling of sand and sand bags, portable pumps, power chainsaws and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

c. Attention must be given to electrical circuits and protection against electrocution during flooding conditions.

d. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

e. Coordinate alternative water supply, as needed.

f. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damage assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

D. SNOW/ICE DAMAGE (Non-security related)

1. GENERAL

These events are based on the weather conditions that result in snow and/or ice conditions affecting the water system property or the water system (at any point within the system). Since this area is not normally prone to this type of weather, the occurrence of such conditions can result in severe injury or damage to individuals, property, structures and delivery systems.

The stockpiling of salt to be used to reduce the freezing effect of ice and snow, power chainsaws and power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in providing assistance and emergency first aid to the injured and notifying emergency services (911).

b. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX A). Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

c. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

d. Coordinate alternative water supply, as needed.

e. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

E. EARTHQUAKES (Non-security related)

1. GENERAL

This event is based on geographical and seismic conditions that occur everyday throughout the world that can have varying effects on the water system property or the water system (at any point within the system). The effects can range from no noticeable implications to catastrophic destruction. Due to the actions involved in earthquakes and the shifting of the ground mass, damage to the infrastructure of the delivery system, earthen or structural, can readily occur. Earthquakes come with a series of "aftershocks" following the main event that can continue to cause damage. The secondary effects of earthquakes are fires caused by broken gas mains and the resulting fire spread due to broken and disrupted water supply normally used for extinguishing them. All of these affects from an earthquake require immediate coordination of all portions of the water delivery system.

The stockpiling of piping and valves, contractual heavy equipment, portable pumps, power chainsaws and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the service area for the DISTRICT Water System has been affected by an earthquake, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. The potential damage due to flooding from reservoirs must be immediately evaluated and monitored.

c. Depending on the size of earthquake, see APPENDIX A for mobilization response.

d. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX B).

e. Damage to property - Due care must be taken while responding in an earthquake situation due to the "aftershocks" and damage they may cause. The need to avoid becoming a victim of injury or being struck by falling wires, trees, weakened or unstable structures should be foremost in everyone's thought process. Consideration to aid firefighting will need to be coordinated with the Twentynine Palms Fire Department. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

f. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

g. Coordinate alternative water supply, as needed.

h. Activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or the process, facility or activity has been isolated from the rest of the utility facilities or it has been determined that this threat is no longer present.

All efforts should be made to keep the public and news media informed of the steps that are being taken and things the public could do to assist in the process.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

F. HURRICANES and TORNADOES (Non-security related)

1. GENERAL

These events are based on the weather conditions that result in extremely high winds and rain affecting the water system property or the water system (at any point within the system). The strong winds may result in structural damage to buildings and may generate flooding of many areas including treatment facilities. The occurrence of such conditions can be anticipated and normally 24 to 48 hour warning is provided. However, the results can still be severe injury or damage to individuals, property, structures and the water delivery systems.

The stockpiling of power chainsaws, portable pumps and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX B).

c. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

d. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

e. Coordinate alternative water supply, as needed.

f. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

G. FIRE (Treat all fires as Security related until proven otherwise)

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

A fire event is based on accidental or negligent situations, act of God, or intentional activity. Each one usually results in property damage and/or injury including death to individuals. The secondary effect is diminished or no service to the consumer by the delivery of product - water. The first goal is to save life and then property and maintain service. Immediate response to extinguish or contain the fire is paramount. It is very important to determine the cause of the fire as it may affect the future use of certain equipment, insurance coverage, and civil and/or criminal action. Good housekeeping, regular preventative maintenance, proper storage of combustibles, portable extinguishers and sprinkler equipped buildings reduce the potential for fires.

Fires can be small (extinguishment can be accomplished by use of a handheld extinguisher) and large fires (any fire that cannot be contained with a handheld fire extinguisher).

THE FIRST STEP IN ANY FIRE IS TO SOUND THE ALERT AND GET ASSISTANCE!

All individuals should be trained in the proper use of handheld fire extinguishers.

Upon becoming aware that any part of the DISTRICT Water System is or has been affected by a LARGE fire event, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. THE FIRST RESPONSE TO ANY FIRE IS TO SOUND THE ALERT AND GET ASSISTANCE.

b. IF after sounding the alarm and getting assistance, you are knowledgeable in the use of the fire extinguisher AND the fire is small, you may extinguish it with the handheld extinguisher OR assist in evacuating the area and wait for the fire department to arrive.

c. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

d. Damage to property - Due care must be taken while responding as fire can destroy the structural integrity of structures and collapsing may occur. You must avoid becoming a victim of injury or being struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

e. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

f. Coordinate alternative water supply, as needed.

g. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

H. TRESPASS, VANDALS and SABOTAGE (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

These events are based on the threat of or actual, intentional trespass, vandalism and/or sabotage of water system property or the water system (at any point within the system).

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been intentionally trespassed, vandalized and/or sabotaged, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

Trespass, vandalism and possible sabotage are handled to a large extent by planning and prevention. Most of the facilities are fenced, gated, locked and constructed to minimize trespass or damage by vandalism. Concerted efforts to stop trespassing and/or damage to facilities, however, cannot be economically prevented. Preventive actions obtained by applying certain

physical and electronic security applications, law enforcement agencies and an alert operating force are also strong deterrents to reducing acts of trespass, vandalism and sabotage as well as the consequent damage. Staff should be aware of suspicious parties that may be loitering near facilities, notify the proper contact(s) or Law Enforcement, make a written note of license plates, descriptions, etc., of suspicious parties, and wait for assistance to arrive, or if appropriate, approach the individuals to ascertain their purpose and identity.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. TRESPASSER(s) - Notify Twentynine Palms Water District Supervisor. If conditions warrant (late at night, secluded areas, other than normally public areas), the immediate dispatching of law enforcement to scene should occur. Twentynine Palms Water District employees should standby to meet and assist law enforcement or be available to handle any water related issues. In all cases of trespassers, appropriate identification, vehicle license, etc. should be obtained and then, as appropriate to circumstances, direct them to leave or be prepared to file criminal trespass charges.

b. VANDALISM and SABOTAGE - Notify Twentynine Palms Water District Supervisor. Immediately notify law enforcement and request presence at the scene. Twentynine Palms Water District employee should standby to meet and assist law enforcement or be available to handle any water related issues.

c. If damage has occurred, deploy emergency response team, treat as crime scene. Standby and be available to assist local/county/state law enforcement and/or FBI to process crime scene for evidence preservation.

d. Coordinate alternative water supply, as needed.

e. Consider increasing security measures.

f. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after trespasser(s) is removed, damage assessed and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that the threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional protection/ security measures for the property or damaged equipment/facility.

I. MAJOR THEFT of EQUIPMENT or CHEMICALS (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

These events are based on the threat of or actual theft of major equipment or chemicals on water system property or the water system (at any point within the system).

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been the victim of a major theft of equipment or chemicals, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

Theft of equipment and chemicals may and can occur at almost any time. Most of the facilities are fenced, gated, locked and constructed to minimize theft. Concerted efforts to stop theft of equipment and chemicals, however, cannot be economically prevented.

Preventive actions obtained by applying certain physical and electronic security applications, law enforcement agencies and an alert operating force are also strong deterrents to reducing acts of theft. Staff should be aware of suspicious parties that may be loitering near facilities, notify the proper contact(s) or Law Enforcement, make a written note of license plates, descriptions, etc., of suspicious parties, and wait for assistance to arrive, or if appropriate, approach the individuals to ascertain their purpose and identity.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Upon the discovery of missing equipment or chemicals, immediately notify Twentynine Palms Water District Supervision and Management. Try to ascertain if equipment or chemicals were moved in an authorized manner. Time is of the essence.

b. If a reasonable search and inquiry (short period of time) do not provide an answer for the disappearance, immediately notify law enforcement and request presence at the scene. Twentynine Palms Water District employee should standby to meet and assist law enforcement or be available to handle any water related issues.

c. Activate the damage assessment team.

d. Consider increasing security measures.

e. Based on extent or type of theft, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

f. Determine with Water Management and law enforcement the type of news release that should be given out to the public, <u>if any</u>.

g. Obtain statements from all personnel as to the last time they saw the item(s) prior to their becoming missing.

h. Notify insurance carrier.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after theft items have been isolated from the rest of the utility facilities or determined that the threat is no longer present or can be dealt with by some other means.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Replace equipment and chemicals.

b. Assess need for additional protection/security measures for the property or damaged equipment/facility.

J. CONTAMINATION (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

1. Any event that impacts distribution water quality to the point that public health is immediately threatened, is based on the water utility being notified by proper authority, or discovering that there may be a water contamination occurrence, will activate this section.

   Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

   To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

   Upon notification or of becoming aware that any part of the DISTRICT Water System has potential contamination, this emergency response plan will be immediately implemented.

   The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. Contamination Types can be generally categorized as disease causing organisms from bacterial, viral or parasites (biological); chemical; organic; radiological.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

c. Public Notice Types

A. "Boil Order" - Notice to boil water prior to use is issued by the California Department of Health Services and is called a Boil Water Order. It is used only in the event that the water supply is found to be contaminated or is likely to be contaminated with disease-causing organisms where boiling will neutralize the effects. As an alternative, chlorine bleach can be used with similar effect. See APPENDIX C for an example of the order language.

B. "Unsafe Water Alert" - Notice on non-potability of water is issued in order to prevent the public from drinking the water and is called an Unsafe Water Alert. It is required if toxic levels of metals, radiological, or organics are found in the water supply. It is issued by the California Department of Health Services (DHS) and contents must be approved by DHS. See APPENDIX D for an example of the alert language.

3. RESPONSE ACTIONS

NOTE: Patient symptoms should be used to narrow the list of potential contaminants.

a. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

b. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Increase sampling efforts to confirm contaminant.

3. Consider whether to continue normal operations (If reduction or stoppage is outcome, provide notification to customers/issue alerts). Discontinue treatment operations and discharge to waste if necessary.

c. Water Distribution/Storage

Isolate the water, drain and disinfect as necessary in the affected area, sample to confirm contaminant.

4. RECOVERY ACTIONS

NOTE: Recovery actions may be tailored to a specified (identified) material if the physical properties for the material are known.

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event (see notification matrix).

6. APPROPRIATE UTILITY ELEMENTS

a. Sample appropriate system storage tanks, filters, sediment basins, solids handling, etc. to determine if residual contamination exists.

b. Flush system based on results of sampling.

c. Monitor health of employees pursuant to medical provider's advice.

d. Plan for the appropriate disposition of personal protection equipment (PPE) and other equipment.

7. REMEDIATION ACTIONS

NOTE: Remediation actions may be tailored to a specified (identified) material if the physical properties for the material are known.

a. Based on sampling results, assess need to remediate or modify processes regarding storage tanks, filters, sediment basins, solids handling.

b. Dispose of PPE and other equipment.

c. Identify recommendations for future facility protection.

K. CONTAMINATION at MAJOR EVENT (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on the threat of, or actual, intentional introduction of a contaminant into the water system at a sports area, convention center or similar public facility.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been notified of a threat against or actual intentional contamination at a major event, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Source Water

NO recommended action to take.

b. Drinking Water Treatment Facility

Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

c. Water Distribution/Storage

1. Isolate water in the distribution system and at the particular site.

2. Sample the water to confirm the contamination.

3. Drain the contaminated water and disinfect.

4. Provide alternate water source.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. WATER DISTRIBUTION/STORAGE

a. Do NOT flush distribution system via hydrants.

b. Move to prevent any risk of backflow. Install backflow prevention devices on all services to the event prior to recovering facility's water system.

7. REMEDIATION ACTIONS

Water Distribution/Storage

Assess need to decontaminate/replace distribution system components.

L. NOTIFICATION by HEALTH OFFICE of CONTAMINANT (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on the water utility being notified by Public Health officials of potential contamination based on symptoms of patients.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has a potential contamination, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

NOTE: Patient symptoms should be used to narrow the list of potential contaminants.

a. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

b. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Increase sampling efforts.

3. Consider whether to continue normal operations (If reduction or stoppage is outcome, provide notification to customers/issue alerts).

c. Water Distribution/Storage

1. Increase sampling in the area potentially affected and at locations where the contaminant could have migrated. It is important to consider the time between exposure and the onset of symptoms to select sampling sites.

2. Consider whether to isolate.

3. Consider whether to increase residual disinfectant level.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

a. Activate notification plan for this particular event.

b. Assist health department.

6. APPROPRIATE UTILITY ELEMENTS

a. Sample appropriate system elements (storage tanks, filters, sediment basins, solids handling) to determine if residual contamination exists.

b. Flush system based on results of sampling.

c. Monitor health of employees.

d. Plan for the appropriate disposition of personal protection equipment (PPE) and other equipment.

7. REMEDIATION ACTIONS

a. Based on sampling results – assess need to remediate storage tanks, filters, sediment basins, solids handling.

b. Plan for appropriate disposition of PPE and other equipment.

c. If wastewater treatment plant was by-passed, sample and establish monitoring regime for receiving stream and potential remediation based on sampling results.

M. UNAUTHORIZED SCADA ACTIVITY (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger, or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on either internal or external unauthorized intrusion of the Supervisory Control and Data Acquisition (SCADA) system.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware of an unauthorized intrusion of any part of the DISTRICT Water System through SCADA, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Teams to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Conduct an initial assessment of the SCADA to determine impact of the intrusion and potential for hazard. Based on findings, determine if additional steps are needed as described below.

b. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

c. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Temporarily shut down SCADA system and implement manual operation using established protocol.

d. Water Distribution/Storage

1. Monitor unmanned components (storage tanks and pumping stations).

2. Consider whether to isolate.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once the intrusion has been eliminated and the containment of unsafe water (if this occurs) is purged from the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. WITH ASSISTANCE from the FBI, make an image copy of ALL systems logs to preserve evidence.

b. WITH ASSISTANCE from the FBI, check for implanted backdoors and other malicious code. Eliminate them before restarting SCADA.

c. Install safeguards before restarting SCADA.

d. Bring SCADA up and monitor system.

7. REMEDIATION ACTIONS

a. Assess/implement additional protections for SCADA.

b. Check for National Infrastructure Protection Center (NIPC) water sector warning based on the intrusion that may contain additional water protective actions to be considered. NIPC warnings can be found at www.NIPC.gov or at https://www.infrgard.org for secure access Infragard members.

N. INTENTIONAL DAMAGE to STRUCTURE (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger, or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on intentional structural damage to water system components to disrupt normal system operations.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has sustained significant structural damage from an intentional act, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Deploy Emergency Response Teams, treat as crime scene – Consult local/state law enforcement and FBI on evidence preservation.

b. Inform law enforcement and FBI of potential hazardous materials.

c. Coordinate alternative water supply, as needed.

d. Consider increasing security measures.

e. Based on extent of damage, consider alternate (interim) treatment schemes to maintain at least some level of treatment**.**

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions as soon as practical after damaged facility is isolated from the rest of the utility facilities.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional protection/security measures for the damaged facility and other critical facilities within the utility.

APPENDIX A

The Twentynine Palms Water District's initial response to an earthquake emergency will be to determine the level of mobilization necessary to meet the immediate, primary objectives. The level of mobilization will be dictated by the initial preliminary inspection of facilities.

MOBILIZATION LEVELS DEFINED			
Level of Emergency	Richter Scale	Mercalli Scale	Level of Mobilization
Level 1 Mobilization	Less than 5.5	1-V1	Limited Mobilization required. (Duty person monitors radio and pager for damage reports from the public and activates initial response team and EOC as necessary.)
Level 2 Mobilization	5.5 to 6.0	V1 - V111	Mobilization required. (Initial Response Team is activated and all assessments reported to EOC.)
Level 3 Mobilization	6.1 to 10	V111 - X11	Full mobilization required, outside services and equipment needed. (EOC activated, action plan developed based on incoming assessments.)

APPENDIX B

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 1

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Campbell Reservoir		
2. Treatment Plant/Well TP 1		
3. Hansen Reservoir		
4. Worthing Reservoir		
5. Cactus Booster		

Notify the System Dispatcher:
" Route 1, Priority I Inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX B continued

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 2

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Donnell Reservoir		
2. Well 16 Chlorine		
3. Well 3B Chlorine		
4. Well 13/14 Chlorine		
5. Well 4 Chlorine		

Notify the System Dispatcher:
" Route 2, Priority I Inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX B continued

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 3

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Stockwell Reservoir		
2. Well 11 Chlorine		
3. Well 10 Chlorine		
4. Lear Reservoir/Pnuematic		
5. Plant 11 Reservoir		
6. Plant 6 tank/Chlorine		

Notify the System Dispatcher:
" Route 3, Priority I inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX C

Date:

BOIL WATER ORDER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

BOIL YOUR WATER BEFORE USING

Failure to follow this advisory could result in stomach or intestinal illness.

Due to the recent event [e.g., water outage, power outage, flood, fire, earthquake or other emergency situation], the California Department of Health Services in conjunction with the [County Name] County Health Department, and Twentynine Palms Water System are advising residents of Twentynine Palms to use boiled tap water or bottled water for drinking and cooking purposes as a safety precaution.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. ***Bring all water to a boil,*** *let it boil for one (1) minute,* ***and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking and food preparation*** *until further notice.* ***Boiling kills bacteria and other organisms in the water. [or This is the preferred method to assure that the water is safe to drink.]***

Optional alternative to include for prolonged situations where it fits.

- **An alternative method of purification for residents that do not have gas or electricity available is to use fresh liquid household bleach (Chlorox, Purex, etc.). To do so, add 8 drops (or 1/4 teaspoon) of bleach per gallon of clear water or 16 drops (or 1/2 teaspoon) per gallon of cloudy water, mix thoroughly, and allow to stand for 30 minutes before using. A chlorine-like taste and odor will result from this purification procedure and is an indication that adequate disinfection has taken place.**
- **Water purification tablets may also be used by following the manufacturer's instructions.**
- **Optional: Potable water is available at the following locations: [List locations]**
  Please bring a clean water container (5 gallons maximum capacity).

We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within [estimated time frame].

For more information call:
Water Utility contact: Ray Kolisz, Operations Superintendent, (760) 367-7546.
California Department of Health Services – Drinking Water Field Operations Branch- District Office at [(909) 383-4328].
Local Environmental Health Jurisdiction: [San Bernardino County at (909) 884-4056].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

APPENDIX D

Date:

UNSAFE WATER ALERT

Twentynine Palms water is possibly contaminated
with [an unknown substance]

DO NOT USE YOUR WATER

Failure to follow this advisory could result in illness.

An unknown substance has been added to the drinking water supplied by the Twentynine Palms due to a recent [intrusion; break-in] at [one of the wells; our treatment plant; storage tank; specific facility]. The California Department of Health Services, San Bernardino County Health Department, and Twentynine Palms Water System are advising residents of Twentynine Palms to NOT USE THE TAP WATER FOR DRINKING [AND/,] COOKING [,HAND WASHING OR BATHING] UNTIL FURTHER NOTICE.

What should I do?

- *DO NOT DRINK OR USE TAP WATER---USE ONLY BOTTLED WATER.* ***Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, and food preparation*** *until further notice.*

- *DO NOT TRY AND TREAT THE WATER YOURSELF.* ***Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.***

OPTIONS

- **Optional: Potable water is available at the following locations: [List locations] Please bring a clean water container (5 gallons maximum capacity).**

We will inform you when tests show that the water is safe again. We expect to resolve the problem within [estimated time frame].

For more information call:
Water Utility contact: Ray Kolisz, Operations Superintendent, (760) 367-7546.
California Department of Health Services at: San Bernardino, (909) 383-4328.
Local County Health Department: (909) 884-4056.

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